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THYROTOXICOSIS: ITS MEDICAL ASPECTS*

BY

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NOMENCLATURE

Despite the fact that some care was taken in choosing the title of this discussion, the term finally decided upon is perhaps still not very satisfactory. While the word "thyrotoxicosis" is sufficiently general to include in our deliberations, as was intended, conditions other than the syndrome which Graves described just one hundred years ago, it has the disadvantage that it postulates a basic fact which has never been established. There is no indisputable evidence that exophthalmic goitre owes its evolution in the main, or even in a lesser degree, to the circulation of disordered thyroid secretion. The same may be said of the symptoms variously classified under the terms "toxic goitre," "toxic adenoma." *Pace* certain textbooks whose authors or editors strive prematurely to substitute for non-committal names of diseases terms having precise pathological connotation, the postulate that exophthalmic goitre is an expression of hyperthyroidism is even less authenticated, whether on clinical or on experimental grounds. So long as this dilemma is recognized and due indulgence granted, I am unembarrassed.

Is There a Pathological Secretion?

I propose that we should consider under our heading of thyrotoxicosis the relation borne by the thyroid gland to the various clinical pictures met with as well as these clinical pictures themselves, rather than confine ourselves to the mere question of poisoning by a hypothetical thyroid dysfunction. Until we find some method of measuring the amount of thyroid secretion poured out into the blood stream—and at present we possess no such method—we shall not solve the main problem facing us in this matter.

There are facts which suggest that the thyroid hyperplasia which is the characteristic change in the fully developed picture of Graves's disease is not the primary, but a secondary, phenomenon. Certainly there is no quantitative relation between the degree of thyroid enlargement and the degree or the duration of the symptoms. These latter may be very severe and active in association with very little, or even with no, thyroid enlargement; but again, the symptoms may be mild and tending to quiescence in association with considerable hyperplasia. Nor is there any reason to believe that we have yet established any qualitative relation: by which I mean that there is no evidence that the secretion from gland tissue that is merely hyperplastic, diffusely fibrotic, or the seat of adenomata, differs from that which is elaborated by a healthy gland. Nor, again, to complete the series of morbid anatomical changes in the thyroid which appear to have associations with metabolic increase and/or with sympatho-mimetic manifestations, is there evidence that the cells of an adenoma itself yield a pathological secretion.

PATHOGENESIS

In considering the pathogenesis of Graves's disease the use of the term "thyrotoxicosis," as already noted, lands us at the very centre of the problem. What is the *causa causans*? It remains hidden. As in so many other instances, Nature has revealed the results of a disease-process, but jealously guards the secret of the exact mechanism by which these results are evolved. We see the picture on the screen quite plainly, but the projector is hidden. That some poison is at work seems an irresistible conclusion. Especially suggestive in this connexion are the crises, often pyrexial, which are so alarming a feature and prognostically so serious. They surely give us a dramatic presentation of an intense toxaemia. There is no reason for believing them to be of microbic origin. Are they metabolic? Or are they due to the flooding of the circulation by some uncontrolled physiological hormone? What part in the pathogenesis of the disease is taken by iodine metabolism?

The removal of a large part of the thyroid gland in a chronic and established case of the disease, resulting, as it often does, in such a marked subsidence of the symptoms, suggests that the source of manufacture of the poison resides in the gland. But the actual proof of this hypothesis eludes us, despite painstaking research. Moreover, we must exercise great care in the argument at this point. Thyroidectomy may interrupt a vicious circle in the patient's interest, and so do good in quite another fashion than getting rid of the cause of the trouble. There are analogies bearing upon this possibility: splenectomy in "splenic anaemia" and the same operation in "acholuric jaundice." It is feasible that the missing clue may be found extrinsic to the thyroid. Indeed, such a possibility is generally regarded as probable. But it may be found to be extrinsic to the involuntary nervous system also, though it certainly appears as though this latter organ bulks largely in, at any rate, the earlier stages of the disease. Biochemistry linked with histology may be the solution—a field of discovery of enormous potential value; as we appreciate when we realize the unveiling of the reticulo-endothelial system, and its bearing upon the mechanism of Addisonian anaemia.

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Of the state of the thyroid gland itself, quite apart from the moot question of the exact relation which it bears to the syndrome in general, I do not propose to deal in detail. I accept, as being a convincing summary of the clinical and morbid histological findings, the conclusions arrived at by my surgical colleague who opens this discussion with me. The fact that so many different pathological conditions may be present in association with the syndrome we are discussing has induced some workers to discard the thyroid altogether as being indirectly concerned in a causative sense. Yet that the gland is intimately bound up with the pathogenesis of Graves's disease seems, on clinical grounds, indisputable. But the factor of metabolic increase has by some been discarded also. Indeed, certain of the recent analyses of this baffling syndrome remind me not a little of the devastating and uneconomical criticism of the cynical friend who gradually reduced the fishmonger's caption—"Fresh Fish Sold Here"—to no caption at all by the elimination of unnecessary words. There was no need for the word "fresh," he said, for surely he wouldn't sell stale fish; no need for the word "here," since his shop wasn't anywhere else; no need for the word "sold," because he didn't give the fish away; and no need for the word "fish," for it could be smelled two streets off. The exophthalmos may be only a symptom, the thyroid gland may be more sinned against than sinning, the involuntary nervous system may be stimulated from without and not from within, and the basal metabolic rate may be low rather than high. But the subtleties of too fine an analysis confuse, rather than clarify, our ideas, seeing that the basic data are as yet so meagre. The stubborn fact remains: Graves's disease exists for all to see: the syndrome repeats itself with increasing persistence and demands our attention. If we take our stand here we are on the sure ground of clinical medicine, and in my further remarks this is what I propose to do. I shall use the terms "Graves's disease" and "exophthalmic goitre" as synonymous.

The Clinical Picture

The known aetiological factors, the symptoms, and the course of the disease call for a few remarks. That there is a diathesis in Graves's disease is generally accepted. But whether the flaw resides in the involuntary nervous system or in the psyche, or in the endocrine balance, or in some other as yet unrecognized tissue or function, or in more than one of these, we do not know. Of the predisposing causes we know a little: sex, certain collateral familial conditions, and an "autonomic imbalance." Of exciting causes there are the sex epochs, there are psychic traumata, and there is focal sepsis. Or is it merely fashion which leads us to speak of the last-named? For myself, I have been very disappointed in the search for focal sepsis in Graves's disease, however thorough this search may have been. Associated endocrine defects are sometimes advanced as a contributory cause, but the evidence is entirely unconvincing. Is this fashion again? Or is the suggestion due to a desire to give support to the hypothesis that exophthalmic goitre is itself an endocrine disorder? Of this, however, there is no good evidence (*v.s.*).

To the original three symptoms observed by Graves—the exophthalmos, the tachycardia, and the goitre—Charcot added tremor. These constitute the cardinal features. Many others have been noted from time to time, among them various ocular changes, dermatoses, glycosuria, neuroses, psychoses, and manifestations of sympathetic instability such as flushing, sweating, and diarrhoea. Loss of weight is very common, though, as in diabetes, which is one of the familial associates, the patient may be fat rather than lean. Lesser degrees of the disease are recognizable, and, given favourable conditions, these quite frequently abort.

An attempt has been made by some to segregate cases which present some of, or even all, the symptoms of Graves's disease, but which show no increase in the basal metabolic rate—a striking feature in the great majority of the established cases. It is proposed to use the term "autonomic imbalance" for those cases in which the basal metabolic rate is not raised. How far this segregation is justified, and what proportion of these cases pass on to what these observers would call true Graves's disease, remains to be seen. Granted that the basal metabolic rate, as a measure of metabolic activity, is of fundamental importance, too much weight must not be attached hurriedly to this criterion. The basal metabolic rate is raised in some conditions which are not, and do not tend to become, Graves's disease. On the other hand, some cases of Graves's disease, if we use the clinical standard, occur with normal, or even lowered, basal metabolic rate.

As regards the course of the disease, in the majority of cases the onset and the early stages are insidious. In a few cases the origin seems to be acute, or even abrupt; but here, as in some other diseases, such as diabetes and disseminate sclerosis, it is usually possible to trace a latent stage of the disease before the exacerbation arrives. When fully developed, and even when the patient is very ill indeed, the disease may subside completely and with no recognizable residues—a very striking experience. Or the established picture may remain long enough to render organic residues permanent, even though quiescence arrives. But, unfortunately, in a large proportion of the established cases the fire, even if it dies down somewhat, continues to smoulder. The patient becomes a chronic invalid, with at first functional and intermitting, and, later, organic and permanent, heart damage. In still other cases the fire, instead of dying out or dying down, blazes, and the patient succumbs to an intense and overwhelming toxaemia.

DIAGNOSIS

The diagnosis of Graves's disease may be very easy or it may be very difficult. The difficulty lies in a recognition of the early and the incomplete pictures. It is these which call for clinical acumen, and it is these which reward the observer so abundantly if he discovers them. The secret, if secret there be, lies in bearing the disease in mind when faced with an obscure case having nervous or metabolic features. Training in the observation of facies and behaviour is of paramount importance. Whenever these deviate from the average we should not rest until we have a positive, not merely a negative, explanation. The formula, "I failed to elicit any signs of organic disease," and the supposed comfort to be derived from it, have hidden many an early case of exophthalmic goitre, and will continue to do so for many years to come. In these days we tend to fall upon a patient too early after our first contact with him, so anxious are we to pass him through the mill of our routine examination of his various organs. Graves's disease in its early stages is a disease of the patient, and not of her organs. So let us give ourselves time to "stand and stare," as the poet has it. We shall then have a chance of observing if the patient is staring, and why. Be it observed that the "stare" is not merely, or perhaps not at all, a matter of exophthalmos: there are the enlarged palpebral fissures, the infrequency of blinking, the dilated pupils, and the immobile forehead. But there is also the manner of entering the room, the hot hand, quickly given and quickly withdrawn, the restlessness, the rapidity of movement, the lack of poise,

the excess of gesture, the record time spent in undressing and in dressing, the moist skin, and the flush on the neck and chest.

Unexplained loss of weight, especially in men who are past middle age, should always raise the question of Graves's disease. So also should certain changes in the patient's behaviour, whether noticed by others or—and this sometimes happens in highly conscientious and self-critical women—by the patient herself: unwonted lack of control, irascibility, excessive show of the emotions, and the quick expenditure of an unaccustomed store of nervous energy without apparent fatigue.

Medical Treatment

In considering the treatment of Graves's disease the physician must concern himself with prevention whenever the diathesis is recognized: a thankless task, for, as a philosopher has truly observed, it is not to be expected that human beings will accept advice when they will not accept warning. And the fact that the potential victim of the disease is more often a woman than a man lessens the chance of much being accomplished in this direction.

The picture of the slighter manifestations of the sympatho-mimetic part of the syndrome—to use Dale and Barger's term—too often escapes detection, as already remarked. Yet if these "larval" types, or "formes frustes," are noted, the physician has a better chance than if committal symptoms had not declared themselves. Even so, his efforts seldom carry conviction. To some his suggestions savour too much of washing in Jordan; to others they constitute an intolerable interference with that round of excitement which entails so much psychological and nervous stress for many young people. The doctor is often accused of wanting to make his patient a cabbage. Yet for those who accept his control and co-operate with him there is undoubtedly a good promise of stabilization. The chief difficulty, next to the temperament of the patient, lies in securing the necessary relief for those who are forced by their economic position to earn their daily bread by jobs which make excessive demands upon their nervous system. Whenever possible—and this applies to all classes—the question of the patient's occupation should be carefully considered. Though it is not necessary that the patient should become a cabbage in order to attain physiological salvation, it may help him very materially to grow cabbages, or something equally useful. The more rustic the type of routine the better; it is no mere shibboleth that leads the doctor to preach the doctrine of "the simple life" to these patients.

If the symptoms persist in spite of controlling the patient's routine of life, and in all cases in which the full syndrome has developed, the degree of physiological and psychical rest should be absolute, and should be continued for at least three months. Bed is the only place where such rest can be guaranteed. A good deal of time can be wasted over compromises for the adoption of which most patients seek to win their doctor's sanction. To yield or not to yield is the test of the latter's experience of the disease. To secure rest of the mind a heart-to-heart talk of an entirely confidential nature is imperative, and it is best to assume the existence of some emotional hold-up, since this is so frequently present. The patient should be given confidence in her ability to get well, though the need for patience should not be concealed. It is better to discount anything by way of a royal road from the first.

If focal sepsis be present this should be eliminated as far as possible. Efforts at specific therapy based upon the hypothesis of the thyroid dysfunction, whether by the use of serum from thyroidectomized animals or from animals inoculated with excess of thyroid secretion, have failed in the hands of most observers. There is no specific drug, though there are drugs that help: iodine certainly, and in all cases in which the thyroid is involved (but surely there is room for more research into the best methods of exploiting this drug to its best advantage); belladonna (introduced by Trousseau) in some; the bromides in others. Of quinine hydrobromide, which has had a vogue, I cannot myself give any good account. Digitalis appears to be unhelpful apart from cardiac dilatation.

Surgical Treatment

There remains the important question of partial thyroidectomy, a form of treatment which has so far justified itself of late years that debate on the main issue seems unnecessary. I am not unaware that this discussion has been staged largely in order that we may benefit from hearing the chief actor in the surgical drama. I will say at once that not only have I sought Sir Thomas Dunhill's expert help in this direction over a number of years but that I have learnt to value his judgement in the interest of my patients to a degree that sometimes quite seriously threatens to jeopardize my own! In what cases, therefore, and especially how, I shall leave my surgical colleague to consider. Suffice it to say that in my own experience the operation should be undertaken whenever the disease remains active after six months of carefully supervised medical treatment, and also in cases which relapse in spite of the patient's routine of life being adequately controlled. I agree, too, that the operation is indicated in all cases in which auricular fibrillation has developed, and that it is indicated still more absolutely when signs of congestive heart failure are present, whether the cardiac rhythm be so affected or not. To delay when any of these three criteria have arrived is to lose valuable time and to lessen the benefit which may otherwise be expected. The technique I leave in better hands. We should all desire that the procedure be as bloodless as possible, that every patient be allowed the benefit of her parathyroids, that the recurrent laryngeal nerves be left intact, and that as few cases of myxoedema be created as may be.

As for the immediate mortality, the difference between a patient being only chronically ill one day and very dead the next is so tragic and so striking—an experience that was not very uncommon until a few years ago—that it is a relief to know that this difference can be eliminated by careful preparation for the operation, by skilled technique in its performance, and by a form of anaesthesia which is competently chosen and as competently administered.

It is not without significance that the most striking results of thyroidectomy are seen in those cases which are advanced and in which the vicious circle is complete, always provided the load of the procedure is not more than the patient can carry. We must consider if the known benefits seen after total ablation of the thyroid in some cases of congestive heart failure throw light upon the rationale of subtotal thyroidectomy in Graves's disease. We must not omit to remember, in this connexion, the fact that surgeons tend to remove more and more of the gland, whether in one or two stages, and that some of them attribute to this change in stratagem and in the tactics involved the better results seen to-day as compared with those seen formerly. That I deal with the question of surgical treatment in even as much detail as I do is because I believe that if we can properly assess the criteria and the responses connected with this important procedure, we shall make a valuable contribution to the elucidation of what is at present a great mystery—the pathology of Graves's disease.

THYROTOXICOSIS: ITS SURGICAL ASPECTS*

BY

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Our thoughts, and mine especially, turn this morning to him who should have been the chairman of this discussion; for the faculty which raised him above his fellows was essentially that of kindling in his associates and his students the desire to acquire more accurate knowledge, and in some subtle and quite unconscious way transmitting to them an eagerness in its pursuit. It never occurred to him or us that work was laborious. It was the very essence of life, and it was nowhere more obvious than in his attitude to this disease thirty years ago. With Osler he realized that it was a disease from which "few recover and many die." It hurt him to feel that years of the best part of a patient's life were slipping away, and that, for some patients, those years were irreplaceable. One of Richard Stawell's phrases is often in my mind, "Youth does not endure." It was his way of saying, "Life is short and time is fleeting."

At this stage I should like to make some acknowledgements—to Dr. Murray Morton, who placed a bed at my disposal for my first operation; to the late Mother Berchmans, Rectress of St. Vincent's Hospital, who subsequently made it possible for this case to be followed by others; and to two—no longer with us—Dr. Cecil Rothera and my brother. Together throughout a long night in 1908, walking up and down Collins Street, we discussed the necessity, the wisdom, and the safety of cutting through the second lobe of a thyroid gland in order to obtain a higher level of health, something more nearly approaching normal than we had been able to obtain by resection of a single lobe. Resection of one lobe had not given us the results reported elsewhere. At that time, cutting across the second lobe seemed a risky procedure, for methods of controlling haemorrhage had not then been perfected. In that year (1908), and in each succeeding year, we published our practice of resecting an adequate amount of both lobes. Four years later (1912) Halsted's article on "The Necessity for Double Lobectomy in the Treatment of Exophthalmic Goitre" was published in the *Annals of Surgery*.

The subject of thyrotoxicosis has been discussed to such an extent in the last thirty years that it may well be asked whether anything of value can be added. We would all deprecate taking up the time of this meeting with the iteration of accepted procedures, but, as with everything else, as we learn and begin to think that we can standardize our knowledge fresh problems arise and they are difficult. These difficulties should form the basis of our discussion this morning.

Lest we be too satisfied with achievement the recent report of the Registrar-General comes to disturb our complacency. The number of deaths from Graves's disease in England and Wales in 1922 was 653. In each succeeding year an almost regular increase occurred, until in the last year of that decade the number of deaths was 1,404. That the death rate should have more than doubled in ten years is startling; but that is not all. The Registrar-General is only concerned with the deaths, and if the cold facts of the death rate are such the unrecorded morbidity can be imagined. The problems of this disease are not finally settled, and there is still much to discuss. Some of us can contribute experience, some will bring the freshness of young and inquiring minds—both are needed. The first problem is that of aetiology.

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Aetiology of Thyrotoxicosis

The disease is not standardized because human beings are not standardized. The protoplasm of each individual has its predestined frailties, as well as its vigour, handed down through the ovum and the sperm of countless generations. Surely this determines to a great extent which system gives way under strain, and why; and for the same reason the wonder is, not that endocrine balance is sometimes upset, but that in the majority it is reasonably good. Also in the matter of environment there are influences beyond our capacity to measure behind the face and figure of the simplest individual. Experience does give us more skill in sensing the background.

It is accepted that the secretion of the thyroid gland causes the manifestations which constitute this disease. The gland has to stand up to the buffetings and vicissitudes of life. We can no longer doubt that its deviation from the normal sometimes dates from a severe shock; nor that worries and anxieties are detrimental to a patient suffering from the disease. But we still have no accurate knowledge of the mechanism that stimulates—or fails to restrain—its activities. The more we know of heredity, environment, and associated conditions the better will we be fitted to deal with a condition of which our knowledge must for a long time yet remain imperfect; and it is well for us to remember that while it is so imperfect some patients will fail to regain completely normal health, whatever method of treatment is followed.

That leads to the question of dogmatic statements and exaggerated claims. It is so frequently stated and written that with rest and iodine preparation every patient may be made safe for operation; and that with adequate operation every patient will be cured. Even your own *Journal of Surgery*—with its very high standard—was somewhat scathing in its review of a well-known and ably written two-volume system of operative surgery because the author of the latter spoke with caution. It cannot be emphasized too much that some patients *cannot* be made safe for surgery; and the sooner the word "cure" is dropped in this disease the better. Greatly improved—yes; saved from landslide and death—yes; but cured? ? Kipling wrote:

> "Light your pipe and have a look among the files.
> You've a better chance to guess
> At the meaning of success
> When you've seen it in perspective in the files."

When Kipling wrote that Governments alone kept records. Since physicians and surgeons have organized follow-up departments not only has the practice helped our patients, but we also have been kept sane—and more truthful. Exaggeration serves no useful purpose. It is a disservice to our profession and to our patients.

The Severer Complications

The second problem is that of the severer complications. How can we detect when the slide is likely to occur? These complications do not become less frequent or less severe. The larger the population the more likely it is that some cases will slip without being spotted, and of these some are likely to become severely ill before they reach a knowledgeable physician who will pilot them aright, and so the severity of the complication increases. These complications fall into groups. (? Is this due to inherited predisposition?)

1. The commonest complication is cardiovascular—with auricular fibrillation, often followed by congestive heart failure.
2. Glycosuria is, in my experience, the next most common.
3. Mental derangement may be severe.
4. Emaciation may be extreme and resistant to treatment.

5. The condition which, for want of a name that would more exactly describe it, has been called quite wrongly "localized myxoedema" is interesting rather than serious, although it is annoying to the patient.

6. Pruritus may be so persistent and severe that the patient scratches the whole body until it bleeds.

The disease occurring in children is full of interest and difficulties, and so are the "formes frustes."

In the paragraphs that follow, discussing individual complications, the numbers of patients are taken from my own series.

Cardiovascular Complications

Regarding cardiovascular complications, I see fewer patients now who are severely waterlogged. By that I mean with oedema well above the waist, with fluid in the serous cavities, and reduced output of urine; but I see many more with established auricular fibrillation in whom gross heart failure has not yet occurred. From that I infer that when auricular fibrillation is first detected it is more generally recognized that the thyroid gland is a possible cause and is therefore examined; and that when the thyroid is the cause more patients are offered and accept surgery as a method of treatment. Furthermore, when regular rhythm has been restored patients are wise enough to submit to stricter observation and to some limitation of their activities. Naturally the exact amount of limitation demanded varies with each individual, and it cannot be foretold either by the extent of the preceding heart failure or by the duration of the symptoms. We see patients who have suffered from congestive heart failure—and for a long time—living active lives for years afterwards, while others, apparently not so ill, do not regain the same robust health. Is this due to the inherited protoplasm of the individual, or differences in the strength, quantity, toxicity, or length of action of the gland secretion, or to some associated condition of cardiac musculature?—for not every heart is sound before Graves's disease commences. The number of patients with established auricular fibrillation upon whom I have operated is 260. Of these, 218 have regained regular rhythm following operation—that is, 84 per cent.; seventeen have died, that is, 6.5 per cent.; twenty have not regained regular rhythm; and five are untraced. A few who had regained normal rhythm have relapsed.

Glycosuria

The second most common complication is glycosuria (fifty-two patients). Discussion of this belongs more appropriately to our medical colleagues. Before operation glycosuria may become difficult or impossible to control, even with insulin. I have not known a case where operation has failed to give considerable relief. A striking case was that of a girl aged 24, who was admitted with toxic goitre, emaciated, and with severe glycosuria. A sister aged 14 and a brother aged 8 had each died from diabetes; her grandfather and an uncle both suffered from it. Following operation ten years ago this patient is in normal health and free from glycosuria. An illustrative case in which relief was not all that could be desired is a woman aged 46, well-to-do and therefore able to have every care, who was advised operation in 1921 when glycosuria and fibrillation were both present. She refused operation for twelve years, until March, 1933, when the glycosuria had become uncontrollable. Following operation the glycosuria is controllable, but some insulin is still required. In this patient normal rhythm has not been regained.

Mental Derangement

Mental derangement (forty-three patients) is possibly the most pathetic complication. The question to be decided is whether this might have occurred apart from the thyrotoxicosis or whether it is due to the disease—an increase (gradual or sudden) of the change in temperament or the irritability so often present. The family and personal history must be carefully examined, and the help of a colleague skilled in mental disorders sought. The choice of this colleague is a matter of importance. It is essential that he should be open-minded enough to know what is possible. One so conservative that he would refuse consent to operation in any sort of mental disorder would be useless. On the other hand, he should be firm if he considers the state of mind is due to causes other than the thyroid. Even when it is certainly a complication of Graves's disease, the management may be difficult. A patient of Sir Walter Langdon-Brown of Bart's and Dr. R. D. Gillespie of Guy's had suddenly slipped from a condition apparently manageable to one almost unmanageable—acute mania, fibrillation, and an almost complete refusal to take food. Operation was only made possible by giving morphine to induce sleep sufficiently deep to permit avertin being given. One artery was ligated at a time, and later an adequate resection. Some days after the third and final stage the first glimmer of intelligence returned, and later every trace of mania disappeared. There are few in whom the mania is so wild and so complete as it was in this patient. To operate on a patient foredoomed to mental derangement would be unpardonable—and we have all made errors of judgement. To illustrate the risks in operating when this complication is present, I must state that three patients, who appeared to be mentally stable, became demented following operation for periods up to three months, and then regained normal mentality. One other—unstable before operation—committed suicide some months later, and one has failed to recover. I believe that all the others—and they number forty-three—have regained normality. I do not include in this series patients with mental irritability, however severe.

Extreme Emaciation

Probably the most difficult cases for either physician or surgeon, and the most dangerous for operation, are those with extreme emaciation, who, in spite of rest in a nursing home or hospital and every resource at our command, continue to lose weight. In these patients iodine has no influence whatever, either on the pulse rate or on the loss of weight. Patients of this type are usually agitated as well, and with a high pulse rate. In the most extreme case the weight had fallen from 8 st. 7 lb. to 4 st. 1 lb. before operation was performed, and in another from 8 st. 13 lb. to 4 st. 7 lb. In the last three years I have had twenty patients in whom the loss of weight has been over 3½ st. In four of these the loss was as much as 5 st. Possibly the usefulness of iodine had been exhausted by its indiscriminate use earlier in the history of the illness, although, as Henry Plummer pointed out long ago, some patients do not respond to it. It is chiefly because of patients in this group that there must always be a death rate of about 3 per cent.—if very ill patients are to be given a chance by operation. When considering the death rate of operation it is to be remembered that sudden deaths are not infrequent in this disease apart from operation. Death in very ill patients may be precipitated by seemingly slight causes, and therefore when severe cases are operated upon some deaths must occur.

Skin Complications

Pruritus in Graves's disease can be severe (twenty-three patients). Many of these were unable to refrain from scratching themselves until they bled over a considerable part of the body, and could not obtain relief until the disease itself improved.

Bilateral symmetrical patches of mucinous degeneration in the skin. This is usually situated just above the ankles on the antero-lateral aspect of the legs, but sometimes it extends to the toes and almost to the knees. This has been described—wrongly—as "localized myxoedema." Myxoedema is a generalized disease, differing entirely from this. This condition does not occur apart from thyrotoxicosis. In many patients it improves or disappears after adequate operation. Our American colleagues state that it reappears later. That has not yet been my experience. My first case was operated upon nine years ago. The condition slowly disappeared and has not recurred, nor has it in five others. In one patient—a very recent case—it was extensive, though still symmetrical and confined to legs and feet. Operation has been performed, but it is too early to judge the result. It is too much to hope that the condition can be materially improved when it is so extensive, although the improvement has been so definite in all the others. One must speculate sometimes. Seeing that this condition is bilateral, symmetrical, confined to limited regions, a swelling of tissues that scarcely interferes with function, disappearing slowly in many patients after operation but intractable in others, is it possible that the swelling in the tissues behind the eyeballs that causes the proptosis is of the same nature?

The Time for Operation

One of the great difficulties of this disease is to recognize when a downhill slide is about to occur. The complications are severe, and in some patients their results irremediable. For this reason some surgeons here and many abroad consider that operation should be performed early—that it is preferable to prevent rather than have to deal with complications. The time at which operation is performed has steadily been advanced; but while family practitioners and physicians know that occasional cases undergo spontaneous cure, and while human nature is still—perhaps fortunately—rather averse from surgical operations, patients will continue to come with the severer complications.

The average patient gives us no anxiety at the time of operation. Among those who are very severely ill there are some whom I personally can only hope to get safely through by making, in the beginning, the smallest inroad that can be depended on to achieve some good. It is not true to say that all patients can be made safe with iodine, at any rate at the late stage at which we frequently see them. Also, it is not true to say that all the poison is in the thyroid gland, and that therefore the best way of dealing with the patient is to remove the greater part of the gland at one operation. This is a misstatement of facts, a misinterpretation of physiology. Henry Plummer showed that one injection of thyroxine will keep up the basal metabolism of a myxoedematous patient for thirty days. Is that injection of thyroxine stored up in the thyroid gland and gradually liberated as required? I think not; surely it is carried to, and stored in, the cells of the body; and in a case of severe toxic goitre the cells of the body are charged—supercharged—with secretion. If in such a person—poisoned, desperately ill—a severe inroad is made—a subtotal thyroidectomy performed—we do not remove all the toxin; on the contrary, we fire the charge and make an explosion. I used often to be asked by surgeons, "Why did a patient upon whom I operated die?" The reply should have been "Killed by the operation." I have done it; and if experience counts for anything it is in judging how much an ill patient can tolerate.

Results of Operations

If I do not spend time in stating the excellent—generally really remarkable—results of thyroidectomy, it is because at this meeting it is of more importance to say that sometimes we cannot hit it off exactly. I know several patients who, after operation, are still on a border line. Sometimes in the same patient the portion remaining is not adequate and a little thyroid extract has been necessary temporarily; at another time the remaining portion of gland has still been too active and a little *x*-ray treatment has been sufficient to reduce its activity. Again, in some patients the remaining portion undergoes too much hyperplasia and a second operation is necessary. We should not regard these as failures. As stated earlier, individuals are not standardized. We have to go back to inherited protoplasm, environment, or sometimes to associated pathological conditions for a possible explanation.

The "formes frustes" present a difficult problem. It is one condition where the basal metabolic rate is of great value. Operation in an unsuitable case is worse than a mere failure to do good, and, as regards the so-called "masked" hyperthyroidism, I am entirely unconvinced. Hyperthroidism is only "masked" when enlargement of the gland, if present, is so deeply placed that its presence is difficult or impossible to detect.

The Disease in Children

The disease occurring in children presents problems in management. It has not been our experience that it can be held in check medically. I have seen fifty-one cases under the age of 17, and of these fourteen have been under the age of 12, and nine under the age of 8—the youngest was aged 4. It has been our aim to control the condition with the smallest interference while development is incomplete. With one child of 8 we continued medical treatment too long and he died. In six *x*-ray treatment has been sufficient thus far. One of these was aged 6. Only in one patient has ligation of arteries sufficed, and in sixteen partial thyroidectomy has been necessary after the less radical measures had failed.

Sexual Disturbance.—I do not want to emphasize this unduly, but I must not ignore it. In one child of 7 sexual precocity was so insistent that it presented a grave difficulty. Following adequate operation (I say adequate because it was performed in stages and the effect of each observed) the child became normal. I think this was not coincidence. The condition before the final operation was too distressing and the improvement quite definite. Sexual problems have not infrequently been present in adults.

X-Ray Treatment

Some patients have undoubtedly been cured, and some patients upon whom I have operated, and who were not as well as they and I would have liked, have been further improved by *x*-ray treatment. One hundred and forty patients who had had *x*-ray treatment given under favourable conditions have ultimately come for operation. Of these, in twenty-three auricular fibrillation had occurred subsequent to the *x*-ray treatment. In seventeen of the twenty-three in whom fibrillation was present the heart rhythm has become normal following operation. *X*-ray treatment has a place in the management of Graves's disease, and in my view its chief value is in the early stages and in young people. In severe cases

and in older patients I do not think its results compare with those of surgery.

Regarding the basal metabolic rate, while it is always interesting to have information as complete as possible, I should not regard it as indispensable in a straightforward case. It is invaluable in the "formes frustes," in differential diagnosis, and in deciding whether an incomplete result is due to continuance of hyperthyroidism; but with private patients whose means are limited it should not be demanded as a routine if the clinical condition is clear or unless the information desired is actually necessary.

CONGENITAL PYLORIC STENOSIS

WITH OBSERVATIONS BASED ON 209 CONSECUTIVE CASES

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The clinical features of a typical case of congenital pyloric stenosis are well known. An infant suffering from this condition is usually healthy at birth: some authorities, indeed, maintain that it is unusually so, and will weigh nearer 8 than the average 7 lb. Typically, the infant is the son and heir, and for the first two weeks behaves normally, taking feeds well, gaining weight, not vomiting, and having normal motions. Then, in the third week, without evident cause, he begins to go downhill. First there is cessation of weight gain, then an occasional vomit, and less regularity of the bowels; soon there is actual weight loss, the vomiting becomes more frequent and copious and rapidly acquires projectile characteristics. At this time constipation is a definite feature, and the napkins are wet much less frequently than before.

Vomiting does not necessarily occur after each feed. One or more feeds may be retained, and then an unusually large vomit empties the stomach of the last and previous feeds together. The vomitus occasionally contains blood, either in the form of fine streaks or intimately mixed, giving a "coffee-grounds" effect. This has occasionally been observed for one or two days after operation. There is a distinct facies in this disease—the furrowed brow, pale face, prominent sucking-pads, over-ready lip reflex, and constant fist-gnawing, being readily recognized by anyone accustomed to seeing many cases. The consistently keen appetite, even after large vomits, and the absence of retching or evidence of indigestion are also helpful diagnostic points.

On physical examination the visible waves of peristalsis are perhaps the most striking feature. These may be seen at any time if the abdomen is examined in a good light—either spontaneously, usually after a feed, or elicited by flicking the skin with the forefinger. They appear as golf-ball-like waves of contraction, commencing beneath the left costal margin, and slowly progressing across the epigastrium towards the umbilicus, clearly outlining the shape and position of the stomach. The point where the waves cease is an indication of the locality of the pylorus, and here the tumour is to be palpated. The tumour is *always* palpable, but whether it is actually felt in any given case depends on a variety of circumstances. It is sometimes tucked up under the liver and can only be appreciated when the stomach has either been emptied or filled, or is actively contracting. Several examinations may be necessary before the olive-like tumour is felt with certainty. There has to be complete relaxation of the abdominal wall, and this may not be readily obtained. The more often each case is examined the nearer will the number of tumours felt approximate to 100 per cent. One other striking feature on abdominal inspection is the marked hollowing of the lower half of the abdomen in comparison with the upper, which is usually distended by the dilated stomach. While the skin turgor is poor, as it is in marasmus, the striking difference between the upper and lower halves of the abdomen is only seen in pyloric stenosis.

Variations in the clinical history are frequent. First, in the time of onset of vomiting, which not infrequently occurs before the third week. In two of our cases it was first observed while the infants were still in the maternity hospital (that is, they were less than 10 days old), in one case, a doctor's child, it occurred on the fourth day: in two more it had quite certainly commenced in the first week. Bilderback has reported a case starting as early as the fourteenth hour after birth. At the other extreme we had three cases in which no vomiting occurred until the sixth week. Ibrahim[14] found that out of 266 cases only five started as late as the eighth week, while Sauer[1] found that not more than 1 per cent. started after the eighth week. Secondly, while absolute constipation is the rule, diarrhoea may occur, and this may be due to one of two causes—(*a*) infection, or (*b*) hunger. The infective type of case occurs earlier—while there is still a fairly patent lumen—and does not differ from other infective diarrhoeas of infancy. The second type manifests itself in frequently passed, small greenish-brown stools, containing little faecal matter and consisting largely of mucus.

Pathology

The pathology of this condition is still unexplained. There have for long been three main theories: (1) that there is a congenital hypertrophy; (2) that there is a primary spasm, with hypertrophy occurring only secondarily; and (3) that there is in every case a combination of both hypertrophy and spasm. The third postulate is almost certainly correct, but the underlying cause has not been fully explained. That there may be a primary hypertrophy is undoubted, for cases have been reported in which a tumour has been present at birth, and even in premature babies. Hyperadrenalism, phimosis (Tyrrell Gray[10]), lack of vitamin B in the maternal diet during pregnancy (leading to a delayed myelination of the pyloric nerve), and many other theories have been propounded.

As regards the cause of the spasm there are even more interesting theories. Ernberg[11] holds that trauma is the basis of every case, the trauma usually arising from overdistension of the stomach. White[12] thinks all these infants are hypertonic, and that there is, in addition, an autonomic incoordination (John Thomson[13]) which leads to contraction of the pyloric sphincter, instead of relaxation, when food reaches the antrum; this continued incoordination rapidly increases the hypertrophy and causes dilatation of the stomach with consequent retention of food and mucous gastritis.

It is a fact that in every case there is dilatation of the stomach and a varying degree of gastritis with swelling of the pyloric mucosa. The swelling usually takes from two to three weeks to reach its maximum. It coincides with the *complete* obstruction of the pyloric lumen, and accounts for the fairly constant time of onset of acute symptoms of the condition. The pressure exerted on the pyloric capillaries may easily cause thromboses and

account for the occasional blood-stained vomitus which is seen. Relief from this pressure by operation causes a rapid return of the mucous membrane to normal. Possibly, in those cases which progress slowly to a spontaneous cure this result is brought about by the gradual atrophy of the pyloric mucous membrane with its consequent shrinkage and gradually increasing patency. If this were indeed so, ephedrine might produce a similar result—particularly if used in combination with atropine.

The chief objection to the second theory is that pyloric tumours have repeatedly been found at birth. The probable sequence is that there is a primary hypertrophy and a secondary spasm, but during the first week of life little food is taken, insufficient to reach the vomiting threshold and bring about that gastric retention, with its associated gastritis, that culminates in pyloric obstruction.

Pathological Anatomy

At operation the appearance of the pylorus is remarkably constant in all well-developed cases. It is white, densely hard, olive-shaped, and in dimensions about one and a half inches long and three-quarters of an inch in diameter. The hypertrophy is mainly confined to the circular coat, which is often three times its normal thickness. The mucous membrane is plicated and oedematous. Sections through the pylorus examined microscopically confirm that the hypertrophy is mainly limited to the circular muscle fibres. Wollstein[3] has shown that post-operative healing occurs by contraction of the fibrous tissue of the serous and submucous coats, and that the stomach and pylorus return to their normal size after about three months. Occasionally the oesophagus is dilated as well as the stomach, though not to such a pronounced extent.

Aetiology

Boys are much more frequently affected than girls. In a large series Feer[3] found 80 per cent. were in boys. In this series we found 91.4 per cent. in boys. First children, too, seem to be more susceptible—in this series 69.8 per cent. It is rare for more than one infant in a family to be affected, though two cases of ours gave a similar history in siblings. Bilderback[4] has reported the condition in twins, and Tribble[5] recorded multiple cases in the same family. In one family which came under our notice there were only two children, both girls: they were operated on for pyloric stenosis, whilst a cousin, the only child, a girl, had also been operated on for the same complaint. In another family there were only two boys, both of whom had pyloric stenosis, whilst in four other families a history was obtained of older members of the family dying in early life from what appeared to have been the same condition.

Diagnosis

The four cardinal diagnostic features are: *vomiting, constipation, visible gastric peristalsis,* and a *palpable tumour.* In a typical case they are all present, and there is no difficulty in diagnosis. Ancillary aids to diagnosis are as follows: (1) The history—first child, male, onset of symptoms in second to third week. (2) The facies (see above). (3) The progressive weight loss at an age when weight gain is normally most rapid. (4) Urinary examination: oliguria and little or no chloride present. (5) An *x*-ray after an opaque meal showing gastrostasis and delayed emptying of the stomach.

The chief condition from which true pyloric stenosis has to be differentiated is *pylorospasm* (the gastro-enterospasm of hypertonic infants). In this connexion it will be remembered that the " position in family " and " sex " are not so pronounced in pylorospasm, but otherwise the symptoms may be very similar, both having visible peristalsis, projectile vomiting, loss of weight, and constipation. The differentiation is made largely by the response to therapy. For this purpose either atropine or luminal works excellently. When fully under the influence of one or other of these drugs the pylorospasm begins to recover ; such is not the case with true pyloric stenosis. Luminal may be given in doses of 1/8 or 1/6 grain, according to weight, before each feed, until drowsiness occurs, and is suitable for out-patient treatment. The atropine treatment is more satisfactorily confined to in-patient cases. Starting with ♏ iij of a 1 in 1,000 solution of atropine sulphate—that is, 1/2 grain to 1 oz.—the dosage is increased by ♏ i before each feed until a definite " atropine flush " is noticed. This may occur at any point up to a dosage of ♏ x. The flush, which commences a few minutes after the ingestion of the atropine, is always readily observable. The correct dosage for any case is ♏ i less than the " flush-producing " dose. It is an interesting fact that cases of pylorospasm seem to tolerate considerably higher doses than do the stenotics —itself a helpful point in differential diagnosis. An important practical point is that solutions of atropine do not retain their potency and should be freshly prepared each week. It is usually stated that the differential diagnosis between these two conditions is of paramount importance because operation is contraindicated in pylorospasm and is dangerous. Actually this is not a fact, and mechanically and theoretically it should not be. One case (not included in this series) on which an operation was performed proved to be an instance of spasm only, but freeing of the pyloric mucous membrane (as in the Fredet-Rammstedt operation) brought about immediate and permanent cure. Nevertheless, pylorospasm probably exists more frequently in the mind of the clinician than in the abdomen of the child.

Another condition which may simulate pyloric stenosis is *congenital duodenal stenosis* (atresia). This rare anomaly is distinguished by the time of the onset of the symptoms—usually within twenty-four hours of birth —by the fact that the vomit contains bile, and by the absence of a palpable tumour. A barium meal may help, and exploration will definitely settle the problem.

Finally, a severe case of *gastritis* may, by the loss of weight and continued vomiting, give rise to a similar picture. Here, however, the vomiting is quite different: it consists of small amounts of food brought up at frequent intervals; it is not projectile in character, is sour, possibly containing bile, is unaccompanied by visible gastric peristalsis, and there is no palpable tumour. Further, diarrhoea is commoner than constipation, and the urine contains abundant chlorides ; the appetite is impaired, in definite contrast to the voracity of the true pyloric stenosis.

Choice of Treatment

The best results have been obtained by medical treatment, with, in each individual case, the relief by the surgeon of the mechanical obstruction at the pylorus at the moment of choice. If the case is a mild one, in which the symptoms have been present for only a short time, medical treatment should be commenced immediately. If it is a severe one it should be operated on at once—in fact, treated as a surgical emergency. Between the above-mentioned mild and severe types there comes a third and most important one ; in this the symptoms are not such as to make the case appear urgent, and though many of them can be, and are, cured by medical measures, quite a number of them will ultimately become severe and require operation at a time when they will be far less able to stand it. These are the cases in which opinions differ as to the line of treatment to be adopted, and from which the majority of failures in both the medical and surgical treatment arise.

If all these cases are treated medically, quite a number will show a definite and progressive improvement, and will completely recover. They will, however, require to undergo continued treatment and close observation for from six to sixteen weeks, during which time they must be considered as weakly children liable to all intercurrent affections to which ailing children are heirs—enteritis, bronchopneumonia, etc. A further number will alternately improve and decline over a period of weeks or even months. Ultimately some of these, having successfully run the gauntlet of intercurrent affections, recover, whilst others will require operation. A third variety will show little or no sustained improvement, and will quickly or slowly develop into the severe type which demands operation.

If surgical intervention is insisted on in all moderately severe cases there is no doubt that many which would have recovered under medical treatment will be included. This, however, would appear to be more than balanced by the knowledge that they are cured more quickly by these means, and that a great many who would eventually require operation will have this done while they are much better able to stand it. All will have eliminated an anxious period of several months, during which, starved and wellnigh exhausted, they are but too willing victims to any complaint that is going round. They will also, by a procedure occupying but a few minutes, be enabled to absorb nutriment in a natural manner, and have the causal factor of their inanition immediately removed.

Medical Treatment

It is a well-known fact that the condition of pyloric stenosis is one which tends to spontaneous recovery from the fourth to the sixth month of life, for although the hypertrophy does not disappear the pyloric lumen gradually increases and more and more food can pass through. Medical treatment aims at keeping the infant alive until this spontaneous improvement commences. The two most important points in the treatment are: (1) maintenance of body fluids, and (2) prevention of infection.

In view of the small quantity of food which can be utilized by oral ingestion, the bulk of the fluid will have to be given parenterally. To ensure the maximum absorption of such food as is given, however, the following methods may be employed.

First, feeding as infrequently as possible—preferably not more often than four-hourly, the food being therefore as concentrated as possible. Any infant fed four-hourly has less tendency to vomit than one fed three-hourly or less often. Having regard to the caloric requirements it will usually be found possible to give an adequate formula using whole lactic acid milk with 10 per cent. glucose added—caloric value 1 per c.cm. (30 per oz.)—if breast milk is not obtainable. The use of wet-nurses, though not so common now as formerly, finds its greatest value in cases of pyloric stenosis, and makes an enormous difference to the mortality of the medically treated cases.

Secondly, thickened foods are said to be vomited less easily, so that each feed may be boiled with 20 per cent. starch until it is of porridge-like consistency. It is fed from a "hygeia" or similar nipple with a wide orifice about the size of a lead pencil, being "basted" in with a spoon. The drawback to this method is that each feed takes about forty minutes to give.

Thirdly, taking advantage of the resting phase through which a stomach usually passes after emptying itself by vomiting, re-feeding may be employed, the approximate quantity vomited being re-fed immediately. This is often successfully retained.

Fourthly, luminal depresses the vomiting centre and may be used in conjunction with the foregoing methods in dosage as described under "pylorospasm." The same applies to atropine.

Fifthly, once (or twice) daily gastric lavage is of particular value where the stomach is already dilated and there is considerable retention and mucous gastritis. Normal saline is a satisfactory fluid to use, or sodium bicarbonate followed by saline. In view of the tendency which exists in all cases of pyloric stenosis to tetany, it is inadvisable to use sodium bicarbonate alone, as its continued use for lavage may precipitate an attack of manifest tetany.

Lastly, parenteral fluid administration. The fluids employed are isotonic saline, dextrose solution 5 or 10 per cent. in distilled water or normal saline, Hartmann's solution,[6] and blood. The routes by which fluids may be administered are subcutaneous, intravenous, and intraperitoneal. If the dextrose is prepared according to the method described by Schwentker[7] fewer reactions will occur than if glucose solutions are used. Blood transfusions are particularly valuable, and may be repeated many times in amounts not exceeding 10 c.cm. per lb. of actual body weight; it is not advisable to use more than 10 c.cm. per lb. lest undue stress on the heart should lead to dilatation, or the increased right-sided pressure should even reopen one of the foetal septal communications, and give rise to signs of congenital morbus cordis.[8] Subcutaneous salines, however, are the main form of this treatment, and are best given by a two-way set, one needle in each flank, pointing towards the umbilicus, and delivered by gravity. Either needle may be inserted into the peritoneum at will, and a combined subcutaneous and intraperitoneal injection given. This latter method has the following advantages: (1) it is quicker, and (2) it supplies both a rapidly and a slowly absorbed quantity of fluid.

If surgical treatment is imminent it is undesirable to give any intraperitoneal injections for the twenty-four hours preceding operation, nor should the subcutaneous fluid impinge on the area to be incised.

Surgical Treatment

The pre-operative treatment consists of: (1) restoration of body fluids, as above, especially blood transfusions in bad cases; and (2) a stomach wash-out immediately before operation.

OPERATION

Fredet's modification of Rammstedt's method[9] is recommended.

The abdomen is opened by an incision one and a half inches long, high up over the inner half of the right rectus, thus obviating the possibility of intestinal prolapse and the needless waste of time in controlling it. The stomach is delivered by pressure on each side of the incision. The pylorus is incised longitudinally, care being exercised to avoid wounding any small vessels plainly seen beneath the serous coat. (If this point is not borne in mind much valuable time will be spent, either at the operation, or again later, looking for and ligaturing small vessels that are difficult to control.) The incision should be carried right on to the stomach: if it falls short of this very little benefit will accrue from the operation, for it will merely permit the lower gastric mucosa more effectively to plug up the exit from the stomach, and the infant may be denied even that little nourishment he enjoyed prior to the operation. The incision is deepened by blunt dissection until the mucosa is completely freed and pouts up into and along the whole of its length. Normal saline is introduced into the peritoneal cavity at the close of the operation; usually about four to six ounces may be left in. The whole operation should not take more than five to seven minutes.

Ethyl chloride and ether, open ether, gas and oxygen, or novocain may satisfactorily be employed. The majority of our cases had open ether, about twelve "bad risks" having local anaesthesia only. At the close of the

operation inhalation of carbon dioxide for half a dozen breaths is a good prophylactic measure against post-operative bronchitis or bronchopneumonia and collapse of the lung.

POST-OPERATIVE TREATMENT

The post-operative feeding schedule is the most important factor in bringing about a satisfactory result. The schedule used in all the later cases in this series is as follows.

Two hours after operation the infant receives 2 drachms of sterile water, two hours later 2 drachms of "formula." The latter has been either whole lactic acid milk with 10 per cent. glucose, or Cow & Gate (1 in 8) "full cream" in those infants who are not breast-fed; if they are still on the breast milk is expressed and given in these quantities. Feeds continue at two-hourly intervals, water and "formula" alternating, increasing by 2 drachms every four hours, until after forty-eight hours the infant is returned to the breast, or is taking 3-ounce feeds four-hourly. If at any time during the forty-eight hours vomiting occurs the schedule is put back to the preceding feed and started off from there again—for example, if vomiting occurs after eighteen hours, when 1½ ounces of "formula" have been given, at twenty hours 1½ ounces of water are given, and at twenty-two hours 1½ ounces of "formula" again, and so on.

Since the introduction of this schedule post-operative complications have been very considerably reduced.

POST-OPERATIVE COMPLICATIONS

These can be classified into two groups: (*a*) surgical—comprising sepsis, hernia, haemorrhage, incomplete operation, and collapse; and (*b*) medical—gastro-enteritis, otitis, pyelonephritis, bronchopneumonia, and "ward infection."

Surgical Complications.—These include any of the sequelae of an abdominal operation—namely, sepsis and breaking down of the wound (due to sepsis or faulty closure), which may be followed by an early or late incisional hernia. Haemorrhage may also occur at the site of the pyloric incision; this can be obviated by exercising greater care in making the incision, and by perfect haemostasis—for example, by underpinning the vessels involved at the time of the operation. An incomplete operation soon makes itself manifest by an early and persistent recurrence of the original projectile vomiting, a condition which requires prompt intervention in the form of a second operation carried out right on to the distal portion of the stomach, as the original incision should have been made. By the severity of its symptoms this condition is readily differentiated from that of occasional vomiting, which in some cases occurs during the first two or three days. Another complication noticed in eight of the cases under review was a sudden and sometimes fatal collapse: four died. This was probably due to the collapse of the lung, and it is regretted that permission for a post-mortem examination was not granted in the cases where this occurred. Inhalation of carbon dioxide, as previously mentioned, is probably the best prophylactic for this complication.

Medical Complications.—"Ward infection" is the most difficult of these complications to be guarded against, and represents the most potent argument in favour of surgical treatment. Infants suffering from pyloric stenosis are by nature weakly, and prone to infection, so that the sooner they are out of hospital the better. In fact, after the first forty-eight hours are successfully passed, and a four-hourly schedule started, the infant may well be discharged. Of the other complications, gastro-enteritis is prevented by the use of a clean, digestible feed in proper quantity; otitis by the daily inspection of the ear drums and prompt use of phenol in glycerin drops at the first sign of reddening of the drum, or myringotomy if necessary. In this series four cases required myringotomy and two antrum drainage. Frequent examination of the urine and the use of sodium bicarbonate (no longer contraindicated after operation) are measures to be taken against pyelonephritis, while bronchopneumonia may be averted by general nursing care.

Review of Cases and Conclusion

There were thirty-one private cases and 178 hospital cases in the series under observation. Of the private cases twenty-two were first-born children—that is, almost 79 per cent.—and thirty were males—that is, 96.8 per cent.

In the private cases there was one death—a mortality rate of 3.2 per cent.—the cause of death being gastro-enteritis, a condition that had been present for several weeks prior to operation, and had never cleared up. This patient died ten days after operation. In two of the cases the symptoms occurred in the first week; in three they arose in the second week; in fifteen, in the fourth week; and in one in the fifth week. The infant that died was operated on in the eleventh week, the condition having been present for eight weeks. It weighed 7 lb. 12 oz. at birth and only 5 lb. 8 oz. at operation.

Mortality and Date of Onset

	Hospital	Private	Total
Number of cases	178	31	209
Number of deaths	29	1	30
Percentage death rate ...	16.4	3.2	14.4
Average age at the onset of symptoms	2 weeks 4 days	2 weeks 6 days	

Detailed Analysis of Both Groups

	Cases that Lived		Cases that Died		Totals		All Cases
	Hospital	Private	Hospital	Private	Hospital	Private	Totals
Average weight at birth	8 lb. 4 oz.	7 lb. 12 oz.	7 lb. 1 oz.	7 lb. 12 oz.	8 lb. 4 oz.	7 lb. 12 oz.	8 lb. 2 oz.
Average weight at operation	6 lb. 15 oz.	6 lb. 13 oz.	6 lb. 13 oz.	5 lb. 8 oz.	6 lb. 15 oz.	6 lb. 13 oz.	6 lb. 14 oz.
Average age at operation	6 weeks 1 day	5 weeks 1 day	8 weeks 5 days	11 weeks	6 weeks 4 days	5 weeks 2 days	6 weeks 2 days
Proportion in which tumour was felt ...	76.6 %	96.8 %	79.2 %	100 %	77.2 %	96.9 %	80.1 %
Proportion in which vomiting projectile ...	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Proportion in which peristalsis visible ...	100 %	100 %	100 %	100 %	100 %	100 %	100 %

An inquiry into the causes of death in the whole group was interesting if not very illuminating—interesting because of the definite tendency towards certain types, not very illuminating because of the impossibility of obtaining post-mortem examinations in a number of cases. It was seen that a number developed bronchopneumonia. Of these five died, even though the lung

involvement was not extensive. A further and greater number developed enteritis, some (particularly the older cases) were suffering from this complaint prior to operation; in all, six died from this disorder. Nine died within a few hours of the operation, apparently without ever recovering from it. Four collapsed and died two or three days after operation, apparently from collapse of the lung—they had been thriving well. Three slowly and steadily petered out, dying some ten to fourteen days after operation. Although they had ceased vomiting, they continued to lose weight, and steadily went downhill without showing any response to remedial measures. It was noticed that a few cases, apparently good operative risks, behaved in this manner; though now obtaining and retaining their feeds, they seemed totally incapable of absorbing them. Others, apparently bad operative risks, immediately and continuously improved from the time of their operation. In this connexion it was noticed that breast-fed children behaved well, but as the vast majority of these had been ill for a shorter period, this is a fact which is perhaps not so significant as might appear at first glance. One died in tetany four days after operation. In another case the stitches burst, and the child died two days later.

Two much stress cannot be laid on the importance of the following two factors. (1) Routine examination of the ears, particularly in cases of raised temperature, fretfulness, and disinclination for food—that is, cases not behaving according to plan. (2) Having a diet scheme and adhering to it: the stupid and malicious practice of eternally changing the diet at the slightest provocation causes both the infant and his attendants to become dizzy.

The early mortality was high (24 per cent. in the first sixty), but no case was ever denied operation, and many were moribund when subjected to it. Now that the cases are seen and operated upon early, most people realize that it is a simple, safe, and certain means of restoring the child to normal in the most rapid manner. In intelligent minds it is no longer the last desperate resort in a well-nigh hopeless condition. Generally speaking, the mortality in private cases is negligible; in hospital cases it is now about 5 per cent., and there is no reason why this should not be further reduced.

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Sir Kingsley Wood, the Minister of Health, has appointed the Central Housing Advisory Committee under the new Housing Act to advise him and local house management commissioners on specific questions which may be referred to it, and also to be available for consultation by the Minister on any questions connected with housing administration generally. The committee is also empowered to make representations to the Minister on any question of general concern in relation to housing. The chairman will be the Minister and the vice-chairman the Parliamentary Secretary to the Ministry, and the medical members are Sir Francis Fremantle, M.P., and Dr. J. Greenwood Wilson, medical officer of health for Cardiff. The secretary to the committee is Mr. H. H. George, *M.C.*, to whom all communications should be addressed, at the Ministry of Health, Whitehall, S.W.1.

QUANTITATIVE ESTIMATION OF VITAMINS A AND D IN VARIOUS FOOD SUBSTANCES COOKED AND FRESH

BY

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AND

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It was impossible to make quantitative estimations of vitamins before the international standards of reference became available, as there were no trustworthy units in which to express results. The *United States Pharmacopoeia* "rat unit" was devised to try to meet this want, but it was defined as "the amount of vitamin A required to produce an increase in weight of 2 to 3 grams per week for five weeks in rats which had ceased to grow on a diet deficient in vitamin A." It was not realized at the time that the animal response to any given dose of vitamin A fluctuates, with the result that the increase in weight of 2 to 3 grams per week could be brought about by different amounts of vitamin A at different times, and that the "unit" of vitamin A activity, therefore, varied accordingly.

Comparisons between different substances or between the products of different treatments of the same substance used to be made by determining the doses of the respective products which gave equal responses in small groups of animals. When the groups receiving the different doses were fed simultaneously the comparisons would be accurate provided the groups of animals were fairly big; but it has often happened that comparisons have been drawn between results obtained at different times, sometimes even after intervals of years, the variation in response of the whole stock of animals being unsuspected and therefore ignored. If a food was found to produce a smaller response in the test animals than it had produced some months previously, it was concluded that the food had lost in vitamin value during the interval. Quite recently an experiment was reported in which a sample of dried carrots had produced a bigger response in the test animals than part of the same sample had when examined three months before, and it was concluded that the vitamin A content had increased during storage. Without a simultaneous test on a standard of reference to estimate the sensitivity of the rats in each examination it is impossible to say whether the vitamin A (or carotene) had really increased in amount or not.

It has lately become possible to compare results obtained in the same laboratory at different times and in different laboratories at all times, because of the adoption of the international standards. Even now this can only be done when a simultaneous test of the standard is made whenever a vitamin estimation is carried out. It is completely misleading to determine the response of a group of animals to a dose of a standard once only and then to equate with that dose all doses of other substances which later produce a response equal to that originally produced by the standard. Coward, Key, and Morgan (1933) found that the response to a dose of vitamin A obtained at one time in their laboratory was five times the response to the same dose a year earlier. Coward and Key (1933) have found that the response to a dose of the international standard for vitamin D in the same laboratory fluctuated also, and at one time it was as much as ten times the response at another time. Similar fluctuations in response to doses of the international standard for vitamin D have also been reported

by Bourdillon, Bruce, Fischmann, and Webster (1931). Thus a result may easily appear to be five or ten times the true result if it is judged merely by the animal response and not compared with a response from the standard obtained at the same time.

Purpose and Method of Inquiry

The estimations of the vitamin A content of foods reported in this paper were made in order to obtain some idea of the absolute values of the vitamin A potencies of cooked vegetables and then to compare them with the vitamin A potencies of other foods. The standard of reference used in each estimation was a particular sample of cod-liver oil, Z, whose vitamin A potency, determined by tests in nine different laboratories, in comparison with the international standard carotene, is accepted as 1,500 international units per gram. Each estimation was made by the method in general use in this laboratory.

Young rats weighing about 30 grams each were given a diet deficient in vitamin A until they ceased to grow. The diet consisted of:

Caseinogen (B.D.H. "light, white") ...	15 per cent.
Dextrinized rice starch	73 ,, ,,
Dried brewer's yeast	8 ,, ,,
Salt mixture (Steenbock's 40)	4 ,, ,,

In addition each rat was given 8 international units of vitamin D in a drop of olive oil once a week. As the rats ceased to grow they were divided into groups, each rat being housed in a separate cage. For the cabbage test three groups of rats were used. Each rat of one group was given 0.25 gram fresh cabbage per day, each rat of another group was given an amount of boiled cabbage equivalent to 0.25 gram fresh cabbage, and each rat of the third group was given 1 mg. of cod-liver oil Z (that is, 1.5 units vitamin A). The dose of boiled cabbage was determined by boiling 20 grams fresh cabbage in tap water without soda until it was tender, imitating as far as possible the cooking of cabbage for domestic purposes; one-eighth of the strained and pressed residue was used as the dose. The loss in weight of the

TABLE I.—*The Estimation of the Vitamin A Content of Certain Foods in Terms of the International Standard*

Substance	Dose	No. of Rats		Average Increase in Weight in 3 weeks		Abscissa of Curve Corresponding to Increase in Weight		Weighted Mean of Abscissae, that is, Relative Potency of Dose	Potency per gram in International Units. (Cod-liver Oil Z Contains 1.5 I.U. per mg.)
		M.	F.	M.	F.	M.	F.		
July, 1934:									
Fresh cabbage	0.25 gram	4	5	17.5	13.2	2.44	1.89	2.13	8.8
Boiled cabbage	0.25 gram (fresh weight) 0.19 gram (actual weight)	3	6	6.7	16.7	1.05	2.96	2.32	9.6
Cod-liver oil Z	1 mg.	4	6	9.7	11.6	1.33	1.54	1.46	
June, 1935:									
Cabbage boiled with salt and soda	0.25 gram (fresh weight)	4	6	22.75	18.2			Potency obviously equal	
Cabbage boiled with salt but without soda	0.25 gram (fresh weight)	3	6	24.3	17.5				
August, 1934:									
Fresh carrot	0.25 gram	8	6	24.4	17.3	4.17	3.20	3.75	17.7
Boiled carrot	0.25 ,,	5	6	30.0	20.7	2.96	4.95	4.05	19.1
Cod-liver oil Z	1 mg.	5	5	2.2	12.8	0.74	1.80	1.27	
August, 1934:									
Fresh carrot	0.5 gram	3	2	9.3	26.0	1.29	9.78	4.69	19.8
Boiled carrot	0.5 ,,	3	2	18.7	23.5	2.66	7.10	4.44	18.8
Cod-liver oil Z	1 mg.	4	1	−2.0	11.0	0.53	1.43	0.71	
October, 1934:									
Fresh runner beans	0.5 gram	9	2	10.0	5.5	1.35	0.70	1.24	5.0
Boiled runner beans	0.5 ,,	6	4	16.6	7.7	2.27	0.93	1.73	6.9
Cod-liver oil Z	1 mg.	3	6	1.0	6.3	0.67	0.79	0.75	
November, 1934:									
Milk	1 c.cm.	5	4	14.2	14.0	1.27	1.30	1.28	2.8 Av. 3.0
	2 ,,	6	6	24.0	23.8	2.30	3.55	2.92	3.2
Milk (Jersey)	1 ,,	4	6	31.2	19.2	3.56	2.22	2.76	6.1 Av. 5.4
	2 ,,	5	7	31.8	26.1	3.69	4.68	4.27	4.7
Cod-liver oil Z	1 mg.	3	6	4.3	7.5	0.70	0.67	0.68	
July, 1934:									
Bone marrow	0.1 gram	3	6	3.7	8.1	0.83	0.98	0.93	8.1
Cod-liver oil Z	1 mg.	1	8	13.0	12.4	1.72	1.70	1.72	
August, 1934:									
Butter, dairy	0.1 gram	4	4	22.5	15.5	3.59	2.54	3.06	45.0
Cod-liver oil Z	1 mg.	4	5	−2.5	10.4	0.65	1.32	1.02	
July, 1935:									
Butter, dairy	0.1 gram	4	5	12.7	8.2	1.68	0.99	1.30	33.6
Cod-liver oil Z	1 mg.	3	4	3.0	1.75	0.79	0.43	0.58	
June, 1935:									
Cheese, English Cheddar ...	0.05 gram	7	8	12.7	11.1	1.68	1.45	1.55	55.0
Cod-liver oil Z	1 mg.	10	5	4.1	6.8	0.86	0.83	0.85	
June, 1935:									
Egg yolk	0.05 gram	9	6	15.8	13.8	2.13	2.04	2.10	30.0
Cod-liver oil Z	1 mg.	6	3	12.8	14.7	1.69	2.29	1.89	

cabbage after boiling and straining averaged 25 per cent. Thus the daily dose of boiled cabbage averaged 0.19 gram. The carrots and kidney beans averaged the same weight after boiling as before. The part of the cabbage used both as "fresh" and as "boiled" consisted of the outer leaves of the head, not the coarse spread-out leaves which are generally thrown away, nor the "stump," nor the thick mid-rib of the leaf. The dose of cabbage was always eaten greedily by the rats.

The mean increase in weight of the male and female rats of each group in three weeks was calculated. The potency of doses of vitamin A is not proportional to the mean increases in weight of the rats given the doses. The relationship between response and dose of vitamin A given is logarithmic. Moreover, the curve of response of male rats is steeper than that of female rats. The respective curves are represented by the equations:

$$y = 6.04 + 29.62 \log x \text{ (male rats)}$$
$$y = 8.24 + 17.93 \log x \text{ (female rats)}$$

in which y = the mean increase in weight in three weeks of a group of rats given a daily dose of vitamin A, and x = the abscissa of the curve. The relative vitamin A potencies of the doses were therefore determined by substituting the mean increases in weight in the appropriate equations and taking the weighted means of the values of x found for male and female rats in each group. The potency of the substance was then calculated in international units by comparison with the result obtained from oil Z similarly treated. Thus (from Table I):

$$\frac{\text{the vitamin A potency of 0.25 gram fresh cabbage}}{\text{the vitamin A potency of 1 mg. cod-liver oil Z}} = \frac{2.13}{1.46}$$

Since 1 mg. cod-liver oil Z contains 1.5 international units of vitamin A,

$$\text{0.25 gram fresh cabbage contained } \frac{2.13}{1.46} \times 1.5 \text{ units}$$
$$= 2.19 \text{ units}$$

and therefore the fresh cabbage contained 8.76, or about 9, international units of vitamin A per gram.

The response of the rats to the dose of boiled cabbage (average 0.19 gram), which was equivalent to 0.25 gram fresh cabbage, was very nearly equal to that of the rats given 0.25 gram fresh cabbage. Thus it is evident that the boiling of the cabbage did not diminish its vitamin A potency.

As it is a custom with some housekeepers to add a little soda to the water in which cabbage is boiled in order to preserve its green colour, a further test was carried out simply to compare (*a*) cabbage boiled with soda, and (*b*) cabbage boiled without soda. No simultaneous test of the standard was made with this experiment, as it was designed simply to determine the possible effect of the soda on the vitamin A content of the cabbage. The details of the result are given in Table I. The average responses of the rats in the two groups are so nearly equal that it is evident that adding soda to water in which cabbage is boiled does not decrease its vitamin A content. (It is well known, of course, that the vitamin A of cod-liver oil is not destroyed by saponification with hot alcoholic potash.)

Two experiments were carried out on fresh and boiled carrots; in one a dose of 0.25 gram of each was tested, in the other 0.5 gram of each. Both tests showed that there is no difference between fresh and boiled carrots in vitamin A potency, which was about 19 international units per gram. Similarly, the difference between fresh and boiled runner beans was found to be insignificant. Their vitamin A potency was about 6 international units per gram.

Comparison with Other Substances

The vitamin A potencies of several other substances have been estimated in this laboratory in terms of the international standard. Milk from the ordinary supply of one of the London dairies was found to contain 3 units of vitamin A per c.cm. Jersey milk from another dairy contained more than 5 units per c.cm. Egg yolk from a fresh egg, hard boiled each day of dosing (June, 1935), was found to contain about 30 units per gram, and one sample of English Cheddar cheese contained 55 units per gram. The average vitamin A potency of seventeen samples of dairy butter was about 60 units per gram, the values of different samples ranging from 26 to 200 units, though nine of the samples contained between 30 and 50 units per gram (Table I).

Comparison between these values and those obtained for the boiled vegetables shows how valuable the latter are, especially when considered in relation to the amounts that may be eaten at any one meal. In Table II are given the approximate vitamin values of some ordinary "portions" of these foods. Thus a portion of about a quarter of a pound of carrots may contain more vitamin A than a pint of milk, though less than a pint of Jersey milk. It may contain as much as a teaspoonful of rather poor cod-liver oil. A portion of boiled cabbage may contain nearly twice as much vitamin A as the yolk of an egg. A portion of runner beans may contain as much as a drop of one of the poorer samples of halibut-liver oil.

TABLE II.—*The Vitamin A Value of Some Common Foods*

Milk (1 sample) ...	3 units per c.cm.	1,700 units per pint
Jersey milk (1 sample)	5 units per c.cm.	2,850 units per pint
Butter (17 samples)	26 to 200 units per gram (average 60 units)	730 to 5,000 units per oz. (average 1,700 units)
Egg yolk (1 test) ...	30 units per gram	600 units in a yolk of 20 grams (¾ oz.)
Bone marrow (1 sample)	8 units per gram	220 units per oz.
Carrots, fresh or boiled (1 test)	19 units per gram	2,000 units per portion of about ¼ lb.
Cabbage fresh or boiled (1 test)	9 units per gram	1,000 units per portion of about ¼ lb.
Runner beans, fresh or boiled (1 test)	6 units per gram	650 units per portion of about ¼ lb.
Cod-liver oil (24 samples)	600 to 4,000 units per gram; a few outs de this range (average 2,000 units)	2,000 to 13,000 units per teaspoonful (average 6,400 units)
Halibut-liver oil (5 samples)	30,000 to 360,000 units per gram (average 160,000 units)	600 to 7,200 units per drop (of 20 mg.) (average 3,200 units)

It must, of course, be recognized that all natural foods vary greatly in their vitamin content. Other samples may be richer or poorer than those described here.

When, however, a concentrated form of vitamin A is needed, as in certain conditions brought about by a serious deficiency of this factor, cod-liver oil or some preparation even more potent than this should be taken. No one has yet shown that excess of vitamin A has harmful effects. Excess of cod-liver oil may be harmful, but Agduhr (1935) and Bell, Gregory, and Drummond (1933) have shown respectively that neither carotene (which is turned into vitamin A in the animal body) nor vitamin A itself is harmful to rats and mice when taken in great excess. Apparently the safest way to take vitamin A is in the form of fresh green vegetables, carrots, milk, and butter.

Vitamin D Content of Some Common Foods

The source of the human being's supply of vitamin D is still a matter for speculation. There can be no doubt that the human being requires vitamin D, for severe rickets and osteomalacia can be cured by giving calciferol (in solution), the purest form of vitamin D known. Most foods contain very little vitamin D, and it is probable that the supply from the food is augmented by the absorption of vitamin D from the skin, where it is formed from ergosterol by the action of the ultra-violet rays from the sun.

The method for estimating vitamin D is similar to that for estimating vitamin A, in that a simultaneous test of the standard must be made in every estimation.

Young rats, weighing 50 to 60 grams, from a colony whose reserves are known to be low in vitamin D, were prepared for each test by feeding them for three weeks with a diet containing no vitamin D and with a high-calcium, low-phosphorus content. The diet consisted of:

Yellow maize, finely ground	76 per cent.
Wheat gluten	20 „ „
Calcium carbonate	3 „ „
Sodium chloride	1 „ „

Tap water was given fresh each day, and the rats were bedded on sawdust, those of any one litter being housed together in one cage. At the end of three weeks each litter was divided into two halves, the rats being paired as nearly as possible according to weight. (Coward and Key (1933) had found that sex had no influence on the result.) Each rat was then kept in a separate cage. All the rats of half of each litter were given a dose of the international standard, 5 units in 20 mg. olive oil, as one dose only. The rats of the other half litters were given a dose of the substance to be tested—for example, 50 mg. cod-liver oil as one dose, undiluted, or 5 grams butter distributed over seven days. Doses of cod-liver oil and of the standard were delivered directly into the rat's mouth from a micrometer syringe, one operator holding the rat and the blunted needle end of the syringe in position while the second operator turned the screw.

Ten days after giving the dose of standard or of cod-liver oil, or after the first day on which butter was given, the rats were killed and the distal ends of the ulnae and radii removed and placed in 4 per cent. formaldehyde for twenty-four hours to clear. They were then separated by a cut with a sharp scalpel, each bone was cut longitudinally and placed in 1.5 per cent. silver nitrate, cut surface uppermost. The phosphates of the bones were converted into silver phosphate, which is decomposed by light and colloidal silver is deposited. Thus the calcified parts were stained black on exposure to sunlight, and the area of calcification in the metaphysis of each bone was easily seen. The more severe the degree of rickets produced by the rachitogenic diet the wider is the metaphysis. Healing of rickets begins by the formation of a flat plate of calcification in the metaphysis, which appears as a thin black line in the section of the bone. (Hence the name for this test, Shipley and McCollum's "line test.")

To use this test quantitatively the thickness of the line of calcification was assessed by comparison with a series of photographs of bones showing graded amounts of healing numbered 0 to 6. Thus with a numerical value attributed to each bone the average amount of healing of all the rats given the same dose of standard or of test substance was found. When the two averages were nearly alike (say, within 10 per cent.) it was safe to conclude that the vitamin D content of the dose of substance tested was equal to that of the dose of standard given, and the vitamin D potency of the test substance was calculated. When the average amounts of healing were not equal but were not widely different, use was made of a curve of response relating average healing of a group of rats to the dose of vitamin D given. (Dyer, 1931; Key and Morgan, 1932.) This curve is logarithmic. The potencies of the doses tested (standard and test substance respectively) are not directly proportional to the average healing produced, but to the abscissae of the curve corresponding to the average healing in the two groups of rats. An estimation of the vitamin D potency of a sample of cod-liver oil may be given as an example of this. It was found recently that (*a*) the average healing of nine rats (halves of four litters) given 50 mg. of a certain sample of cod-liver oil was 2.28; (*b*) the average healing of nine rats (the other halves of the same four litters) given 5 units of the standard was 1.61.

Now the abscissa of the curve corresponding to a healing of 2.28 is 0.166; that corresponding to a healing of 1.61 is 0.101. Thus the ratio $\frac{2.28}{1.61}$ for healing corresponds to the ratio $\frac{0.166}{0.101}$ for dose of vitamin D given. Hence

$$\frac{50 \text{ mg. cod-liver oil}}{5 \text{ units vitamin D}} = \frac{0.166}{0.101}$$

and therefore 50 mg. cod-liver oil contain $\frac{0.166}{0.101} \times 5$ units = 8.2 units vitamin D. Therefore this sample of cod-liver oil contained about 160 international units of vitamin D per gram.

If the average healing produced in either of the groups of rats (one given the standard and one given the test substance) is more than three times that produced in the other, another test should be made, using a dose of test substance which, judging from the first test, is more nearly equal in potency to the dose of standard used.

In Table III are collected estimations of the vitamin D potency of several foods in common use, though it must be realized that different samples of any food may vary greatly in vitamin content. In this table also are stated the amounts of vitamin D that may be present in some ordinary "portion" of the food eaten.

TABLE III.—*The Vitamin D Values of Some Common Foods Expressed in International Units*

Calf liver (1 sample) June, 1935	Nil even when tested as 10 per cent. of the diet	
Milk (20 samples) ...	0 to 0.1 unit per c.cm.	Not exceeding 50 units per pint
Butter (17 samples)	0.4 to 4.0 units per gram (average 1.2 units)	10 to 100 units per oz. (average 34 units)
Cream (1 sample) ...	0.5 unit per gram	80 units per gill
Egg yolk (2 samples)	1.5 and 5.0 units per gram	30 to 100 units per yolk of 20 grams
Cod-liver oil (240 samples)	60 to 300 units per gram; a few outside this range (average 150 units)	190 to 1,000 units per teaspoonful (average 488 units)
Halibut-liver oil (10 samples)	2,000 to 4,000 units per gram; one outside this range (average 2,400 units)	40 to 80 units per drop (20 mg.) (average 48 units)
Olive oil	Nil, even when tested as 20 per cent. of the diet	

It is evident that the vitamin D content of most common foods is low. Thus a pint of milk was seldom found to contain as much vitamin D as a quarter of a teaspoonful of a poor sample of cod-liver oil. An ounce of butter contained less than this. Egg yolks varied in their vitamin D content, being a little richer than butter, weight for weight. Fresh calves' liver apparently contained no vitamin D at all.

Summary

The vitamin A potencies of milk, butter, egg yolk, and various vegetables have been estimated quantitatively in terms of the international unit by comparison with one sample of cod-liver oil of known potency, a test on the oil being made simultaneously with the test on each food substance.

The boiling of the vegetables in a manner similar to that used in ordinary cooking did not destroy any vitamin A.

Boiled carrots, cabbage, and runner beans have been shown to be valuable sources of vitamin A, in view of the amount that can readily be eaten. Their potencies are about one-third, one-seventh, and one-tenth respectively of an average sample of summer butter, which contains 60 units per gram.

Tables are given showing the vitamin A and D potencies of various foods expressed as the number of international units per gram of food, and also as the number of units in a "portion" of the food usually eaten.

We acknowledge with thanks the help given by Miss H. M. Bruce, Mrs. E. Kassner, and Miss G. E. Phillips in some of the tests quoted in this paper.

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IMMEDIATE OPERATION IN ACUTE APPENDICITIS

A FURTHER NOTE ON SIXTY-SIX CONSECUTIVE CASES

BY

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Since publishing my paper on "The Fallacy of Expectant Treatment in Acute Appendicitis," [1] I have operated upon a further sixty-six consecutive cases. The results obtained confirm me in the belief, expressed in that paper, that immediate operation is greatly preferable to delayed operation. Signs are not wanting latterly which show that the general trend of opinion is in the same direction. Some of the most devoted adherents of the delayed operation have cooled off very considerably, and accounts in textbooks are very much modified or relegated to small print.

Unfortunately, even yet, gross misstatements are common, and the advocates of immediate operation are accused of insisting that the appendix should be removed forthwith at all stages of the disease, whether an abscess is present or not. Therefore it is still necessary to emphasize most firmly that immediate operation does *not* mean removal of the appendix at all costs. In the majority of cases it can be removed without difficulty or danger. In exceptional cases it may be both difficult and dangerous, and no surgeon of experience would attempt to remove it. Practically always this means a fixed appendix plus an abscess.

I have already pointed out the advantages of immediate operation in these cases as compared with the extremely anxious nursing problem under the delayed method. Under the former drainage can be established, the diagnosis is confirmed, the type of caecum and appendix is ascertained, and the acute stage can be allowed to settle down without the necessity of watching the patient hour by hour.

In the sixty-six consecutive cases primary appendicectomy was performed in sixty-five, and in one the appendix was removed by a second operation a month later; there were sixty-four recoveries and two deaths. The two deaths are slightly above the average of 2.5 per cent. in my previous series of 551 cases, but in neither can the principle of immediate operation be blamed, as can be seen from the details.

TWO FATAL CASES

The first case, No. **47869**, was a poorly nourished girl of 15½ with a history of pulmonary tuberculosis in infancy. She was operated upon on the day of onset. The appendix was acutely inflamed but had not perforated; it was removed and the wound was closed without drainage. Next day her temperature was 101°, but she felt "quite well." The second day after operation signs of diffuse peritonitis were present. The wound was reopened and about half a pint of brownish purulent fluid evacuated; there was no faecal odour and the appendix stump area was intact. She died the third day after operation, the post-mortem report being: "Generalized peritonitis, presumably beginning in appendix region." I regret that owing to some error we had no bacteriological report on the peritoneal exudate—presumably death was due to a virulent streptococcal infection.

The second fatal case, No. **41584**, was a woman of **35** who had been ill for some days (number not stated) and on admission showed signs of diffuse peritonitis. At operation there was a typical obstructive appendicitis with gangrenous mucous membrane and perforation. The appendix was removed and the wound drained. She died the fifth day after operation.

[1] *Brit. Journ. Surg.*, 1934, xxi, No. 83.

Statistical Details of Sixty-six Cases

The following tables (I to IV) give the statistical details of the sixty-six cases:

TABLE I

Days from Onset	Limited to Appendix		Local Peritonitis		Diffuse Peritonitis		Local Abscess	
	R.	D.	R.	D.	R.	D.	R.	D.
1	5	1						
2	18	0	5	0				
3	9	0	1	0	1		2	0
4	1	0	1	0				
5	1	0						
6	1	0					2	0
7								
8								
9							1	0
10+	6	0					2	0
Not stated	6	0				1	2	0
Totals ...	47	1	7	0	1	1	9	0

64 recoveries; 2 deaths.

Comment on Table I.—In the sixteen cases operated upon in the so-called "negative phase" from the third to fifth day there were no deaths. From a total of only sixty-six cases this would not be of any great significance. Its value lies in the confirmation it gives to the conclusion drawn from a similar table of 551 cases in my previous paper—namely, that there does not appear to be any set relation between the operative mortality and the time since onset, at any rate so far as the third to fifth day period is concerned. All the cases in Group I showed definite inflammatory changes in the appendix up to actual gangrene of the mucous membrane. In one case in this group operated upon on the third day the lateral wall of the caecum was much thickened and inflamed (? tuberculosis) and a partial resection was performed. Microscopical section showed acute inflammation only.

TABLE II

Age Groups	Male		Female		Total	
	R.	D.	R.	D.	R.	D.
0- 9	1	0			1	0
10-19	13	0	8	1	21	1
20-29	10	0	11	0	21	0
30-39	6	0	3	1	9	1
40-49	4	0	4	0	8	0
50+	3	0	1	0	4	0
Totals ...	37	0	27	2	64	2

Comment on Table II.—The absence of children under 10 is due to the fact that we do not as a rule admit children under 12 to the Infirmary. This does not affect the issue, since it is generally agreed that children are not suitable subjects for delayed operation.

TABLE III.—*Localized Abscess. Details of Operation*

	Cases	Deaths
Appendicectomy and no drainage ...	1	0
Appendicectomy and tube drainage ...	7	0
Drainage only	1	0
Totals ...	9	0

Comment.—As will be seen from Table I these cases were operated on any time from the third to the tenth + day inclusive, and the appendix was removed in all but one. This patient, a woman aged 21, had an eventful history. A gynaecologist drained a pelvic abscess by posterior colpotomy in May, 1934. She was readmitted as an emergency in March, 1935, when I drained a pelvic abscess above the pubis, but made no attempt to remove the appendix. Appendicectomy was performed a month later, and she made a good recovery. If these cases are added to the eighty-eight cases of abscess previously reported, with three deaths, it gives a mortality of practically 3 per cent.

TABLE IV.—*Average Stay in Hospital after Operation*

	Days
Group I, limited to appendix	11
Group II, localized peritonitis	16
Group III, diffuse peritonitis	27
Group IV, localized abscess	20

Comment.—So far as the last three groups are concerned the disease must take its course, and the above figures are rather less than the average for the previous 551. Group I shows a 1.5 day increase. Of the forty-seven cases in this group thirty-two were discharged between the sixth and tenth day after operation; the remaining fifteen extended from the eleventh to the thirty-fourth day. The delay was due to more or less infection of the abdominal wall, a difficult matter to prevent. I strongly suspect that the case (a boy) discharged on the thirty-fourth day could have been discharged considerably earlier if he had not been extremely useful for running errands in the ward! Without him the average stay for this group would be 10.5.

Post-operative Complications

Apart from the superficial infection of the abdominal wall there was only one case of post-operative complication. This was a man, aged 58, with a history of a swelling in the right lumbar region for three or four weeks, suggesting a carcinoma of the caecum. *X*-ray negative. Even at operation the diagnosis was obscure until the caecum has been freed and a rectrocaecal abscess was found. The appendix was removed and lumbar drainage established. An abscess in the abdominal wound was drained seventeen days later, and he was discharged thirty-nine days after the first operation. He was readmitted a fortnight later with a small intestine fistula. This was closed, and he was finally discharged seven weeks later.

Cases of this type are a difficult problem; the diagnosis is uncertain, and it is probably always wiser to explore than to go on waiting indefinitely. It should be noted that he had already been under observation for three or four weeks before operation.

TABLE V.—*Obtained by Adding the 66 Recent Cases to the 551 Already Published—Total 617*

I Limited to Appendix			II Local Peritonitis			III Diffuse Peritonitis			IV Abscess			Totals		
R.	D.	Mort.	R.	D.	Mort.	R.	D.	Mort.	R.	D.	Mort.	R.	D.	Mort.
287	1	0.34%	209	6	2.8%	11	6	35.3%	94	3	3.09%	601	16	2.59%

Discussion and Conclusions

Although ideally these figures are by no means perfect and the mortality in diffuse peritonitis is appalling, it is difficult to see how they can be improved until all cases can be operated upon within a day or so of the onset.

At any rate they justify the immediate operation in claiming:

1. A low total mortality.
2. An effective way of dealing with abscesses.
3. A minimum period in hospital.
4. Comparative freedom from post-operative complications.
5. General applicability for all classes of institutions (public or private) and a minimum of special nursing.

On the other hand, apart from the fact that the delayed operation is based on faulty pathology, the published figures are not as good as those for the immediate operation. Even if they were as good they still would not justify the extra trouble and anxiety. As it is, it is open to the following objections:

1. The total mortality is rather greater.
2. The mortality for cases where expectant treatment fails rises to 6 per cent.
3. In any event it is not suitable for children or the aged.
4. The period in hospital is considerably longer, and to this must be added a further period for the subsequent appendicectomy.
5. Post-operative complications are more frequent.
6. It can only be carried out in selected institutions, with a maximum of nursing care and the possibility of demanding an urgent operation at any moment.

Clinical Memoranda

Rheumatoid Arthritis with a Large Number of Subcutaneous Fibrous Nodules

The fibrous nodules of rheumatic fever and rheumatoid arthritis are interesting for several reasons, the chief of them being that they seem to form a link between the two conditions. They are not found outside the rheumatic group of diseases. They are believed to be the result of a specific tissue reaction to a toxin, possibly streptococcal. Rheumatic fever is probably due to streptococcal infection. Those who hold that rheumatoid arthritis is due to infection put streptococci first as possible agents.

These nodules may be thought of in three groups:

1. Nodules of rheumatic fever. Seen in children with cardiac lesions; rarely painful; seldom larger than half a pea; rarely last as long as six months.
2. Nodules of chronic arthritis. For obvious reasons generally seen in adults, but may occur in Still's disease (rheumatoid arthritis of children); not uncommon in the rheumatoid, they are rare in the osteo-arthritic type of arthritis; often painful; may be an inch or more across; often persist for years.
3. "Millet seed nodules," a minute form described by the late Vincent Coates in rheumatic children without cardiac lesions, and in rheumatoid arthritis.

The histology of the subcutaneous nodules and of the so-called "Aschoff's bodies" found in the cardiovascular system and synovial membranes in rheumatic fever, as microscopic periarterial nodules, is the same. Indeed, on the basis of nodules alone it is difficult to avoid the conclusion that rheumatoid arthritis and rheumatic fever have a similar origin.

The following case is of interest because of the numerous nodules present.

A frail lady of 59, who for many years had had minor rheumatic troubles, developed rheumatoid arthritis in 1929. It began in the proximal interphalangeal joints of her fingers and eventually affected all her joints except her hips and spine. Her past history included achlorhydria and a fracture of the left femur in 1925 which had not united, but not rheumatic fever. When admitted to the clinic this year her

general health was fair and she was suffering from the results of a "burnt-out" arthritis. There was no evidence of a possible infective focus. The striking feature of her case was the unusual number of subcutaneous nodules. They had begun to appear two years previously—that is to say, four years after the arthritis started. They varied in size from an inch across to that of half a split pea. They were causing little trouble except where pressure sores had formed over them, but had all been more or less painful at times. Their distribution was as follows:

Occipital ridge (1). Forehead (1). Ulna (R. 12, L. 9); two of the largest were over each olecranon process. Hands, palmar surface (R. 18, L. 15); dorsal surface (R. 12, L. 10); most of these nodules were adherent to flexor or extensor tendons. Patella (R. 4, L. 3). Head of fibula (L. 1); the skin over this nodule was ulcerated owing to pressure due to eversion of the fractured limb. Ankle (R. 1, L. 1). Spine of scapula (R. 3, L. 3); pressure sore over one of these nodules. Spine (4); over one nodule the skin was giving way. Sacrum (5). Buttock (1); the skin over this nodule was ulcerated.

In all over one hundred nodules were easily counted. It will be seen that their presence introduced an unpleasant complication into the nursing of a thin and crippled patient.

A. R. NELIGAN, M.D.Lond.,
Honorary Physician, Royal Brine Baths Clinic.

Droitwich.

Asymmetrical Limb Development

One is so accustomed to symmetry in physical development that a case such as the following is probably worth recording because of its rarity.

The patient is not yet 14, but is tall for her years, and the complaint, when she was brought to consult me, was a limp on walking. The right leg was found on measurement to be a little over two inches longer than the left. About an inch and a half of this increase was in the length of the femur, and the remainder in the tibia and fibula. Even the long bones of the right foot show a slight increase on those of the left. In circumference the right thigh is definitely less than the left—an average of a little over one inch. Below the knee the difference in circumference between the two limbs is less marked, but the right is the more slender. The remainder of the body is quite symmetrical. There is, of course, a compensatory scoliosis, but the *x*-ray examination of all the bones and joints concerned reveals little or no deformity in bone or joint formation.

It might be argued that the left leg was under-developed, but in proportion to the other limbs it is nearer the normal length, and, moreover, the muscle development there is the more natural. In the right the muscles appear to have lengthened at the expense of their girth. There is a certain degree of irregular capillary angioma in the skin of the right thigh and calf, and the surface veins are slightly varicose. I have been wondering if some little difference in blood volume of the limbs may account for their difference in development.

The accompanying photographs show the differences mentioned. In the anterior one the iliac spines are marked, and in the posterior the level of the iliac crests. The condition is, I should think, rare, and the reason for the inequality a matter for conjecture.

Stewarton, Ayrshire. MATTHEW BOWMAN, M.B., Ch.B.

Reviews

DIET AND PHYSICAL EFFICIENCY

In their recently published book *Diet and Physical Efficiency*[1] Drs. H. W. HAGGARD and L. A. GREENBERG present the results of their study of a "hitherto neglected element in nutrition": the influence of frequency of meals upon physical efficiency and industrial productivity, the quantity and quality of the diet being adequate. The attempt is made to discover and formulate the principle of the best meal-time interval. In applying themselves to the solution of this problem, which is one of direct practical importance not only in industry but in everyday life, the authors have adhered rigorously to scientific method. They present in this monograph a mass of material which is of interest to physiologists and experts in nutrition as well as to employers of labour and the general reader.

A convenient feature of the book is that the authors summarize their results in the first chapter, thus whetting the appetite for the remaining eight, which are devoted to an account of the investigations undertaken in arriving at these results. They show that a high muscular efficiency is the objective and measurable accompaniment of a subjective feeling of well-being and vigour; that the rise and fall of this efficiency is correlated with the rise and fall of productivity among factory operatives performing manual tasks; and that the frequency of meals—the daily food remaining the same in quantity and quality—is a controlling factor in determining the rise and fall both of muscular efficiency and of industrial output. Muscular efficiency is shown to be lowest before breakfast—a time when everyone is most rested and freest from fatigue in the ordinary sense. If no breakfast is taken, muscular efficiency remains at this low level—a condition which the authors designate as "the before-breakfast state." Following a meal of the ordinary mixed type muscular efficiency rises sharply. The rise induced by food is correlated with an increased utilization of carbohydrates.

The relations between blood sugar and the discharge of insulin are discussed at length, together with the specific effects upon immediate muscular efficiency induced by each type of food. It is shown that a convenient index for this rise and fall of muscular efficiency is afforded by the respiratory quotient, and that while the respiratory quotient and muscular efficiency rise after meals they both fall again to the before-breakfast level within a period of two and a half to four hours unless another meal is taken. This rise and fall of efficiency is largely independent of any task performed, and occurs in the resting man as well as in one working vigorously. It is not, the authors conclude, a phenomenon of fatigue, although the effects resulting from the fall in efficiency might be, and often are, interpreted as due to fatigue. Their findings appear to the authors to indicate that diminished productivity hitherto attributed to "fatigue" may in reality be dietary. This subject—the problem of industrial fatigue—is discussed in an appendix to the book, wherein the authors draw a distinction between "fatigue" remediable by rest and "impairment of productivity"—the really important feature of "industrial fatigue"—remediable to a considerable extent by the more advantageous distribution of meals. They show that the "pattern of productivity" of industrial workers is directly influenced by the number of meals taken during

[1] *Diet and Physical Efficiency.* By H. W. Haggard and L. A. Greenberg. New Haven: Yale University Press; London: Humphrey Milford, Oxford University Press. 1935. (Pp. 180. 13s. 6d. net.)

the day. A change of from three meals a day to five (with no alteration in the total amount of food eaten) was found to abolish a fall in production, in the late hours of the morning and afternoon, which had previously been attributed to the development of fatigue. The more advantageous distribution of the diet may increase the output of factory operatives by as much as 10 per cent.

The authors conclude that the common practice of eating the day's supply of food in three instalments does not permit the greatest efficiency, vigour, and freedom from distraction of which the individual is capable. Five meals a day yield the maximum of efficiency. For the working man or woman, as for the active growing child, the highest efficiency and vigour require, according to Drs. Haggard and Greenberg, not more food but food in smaller amounts at more frequent intervals.

NUTRITIONAL DISORDERS IN CHILDREN

By omitting infectious diseases from his consideration Professor KURT SCHEER has been able in "Diseases of Children and a System of Nutrition"[2] to deal with the maladies of childhood almost entirely from the standpoint of food intake and assimilation. After an introductory section on statistics and the bodily development of the infant, the book is concerned mainly with nutrition and its disturbances, including the deficiency diseases. Constitution and two diatheses—exudative and allergic—receive brief mention, and the concluding section deals with psychological development and training. This method of approach is ingenious, and the result is a novel outlook, limited only by the inevitable personal predilection for certain methods of infant feeding which are not universally accepted.

APPLIED PHYSIOLOGY

When Professor BINET was appointed to the chair of physiology in Paris it was suggested to him that a weekly lecture or discussion on some aspects of physiology in their application to medical and surgical problems might be useful. The first collection of these conferences has been published,[3] and covers a variety of interesting matters. Professor Binet himself discusses the means of reanimation of the dead. Following up the methods used to demonstrate the surviving heart in cold-blooded and warm-blooded animals, it is shown that the respiratory centre and brain of fish may be kept active by perfusion with solutions containing caffeine. The problem of reanimation is not devoid of sense, and experiment may point the way to solution. It may be applicable in many surgical and medical emergencies, and, after all, there is all to gain and nothing to lose in a patient already *in extremis*. Vascular problems are always of interest. Dr. Patel discusses the pathology of arterial embolism and the changes in the peripheral tissues, together with the respective merits of embolectomy or resection of part of the artery. Arterial atheroma in experimental animals lends itself to discussion of the variations in the blood constituents, the state of the arterial tension, and the histological changes in the vessels and kidneys when excessive amounts of irradiated ergosterol are administered. It is found that iodides and citrates of soda often prevent, and always reduce, the calcifying effects in the aorta and kidney which usually follow in an animal that is given ergosterol alone. Experimental nephritis from uranium lends itself to full investigation; and analyses point to the value of alkalinization as a useful therapeutic measure. Among digestive problems experimental gastroduodenal ulcers, intestinal occlusion, and acute pancreatitis are dealt with.

Dr. Benhamon discusses the modern views of the functions of the spleen. It acts as a reservoir for blood corpuscles, storing a supply which is immediately available when needed. Exercise, rapid climbing of stairs, mild asphyxia, emotion, slight haemorrhage, and the subcutaneous injection of 1 mg. of adrenaline all produce contraction of the spleen, which may be shown with *x* rays or the increase of cells in the blood. A further function in haemopoiesis can be demonstrated, while the reticulo-endothelial cells have a lytic action on red and white blood corpuscles and on the platelets. The lytic functions predominate in cases of purpura and haemolytic jaundice, while in splenic anaemia the reservoir function is also suppressed. Therapeutic indications are becoming more defined. When the lysis of platelets is increased, as in purpura, radiotherapy may diminish this excessive function, as will splenectomy if other parts of the reticulo-endothelial system are not overactive. This may apply also in certain forms of haemolytic jaundice; while in haemolytic splenomegaly, in which the reservoir function is in abeyance, complete cure may follow splenectomy. The loss of reservoir function is shown by the tests of spleno-contraction remaining negative.

Modern views on the functions of the spinal cord, vitamins, and endocrine glands are made available and their clinical applications are discussed. The biological diagnosis of pregnancy is fully dealt with, and, finally, Dr. Arthus has a most useful summary of modern knowledge of venenes and poisons of snakes and scorpions. It will be seen that the field covered is a large one. Written by experts, the book gives in short a great deal of information.

HUMAN HEREDITY

ELDON MOORE, lately editor of the *Eugenics Review*, has written a book, *Heredity: Mainly Human*,[4] which is addressed to the educated and intelligent reader who knows nothing of the subject but wishes to understand its main outlines without intending to pursue it much further. Into this category fall naturally the majority of medical practitioners.

It behoves the profession to recognize that amongst the general public what may be called a eugenic conscience is slowly developing. It is realized that the characteristics of the next generation are not determined purely by accident. It is known that a great deal of fairly exact knowledge concerning human heredity has been accumulated, and it is argued that such knowledge should be now applied. The public, naturally and rightly, turns for information and guidance in such matters to the medical profession, and it is therefore important that the general practitioner particularly should possess the knowledge that will enable him to answer the questions that are put to him. At the moment there is a danger that the instructed layman will know more than does the physician. Furthermore, in preventive medicine, State medicine, some understanding of human genetics is becoming more and more essential, for there are few general public health questions in which human heredity is not involved to a greater or lesser extent, and with the widening of this aspect of medicine, and with its growing importance, an understanding of genetics is becoming increasingly necessary.

[2] *Kinderkrankheiten und Ernahrungslehre*. By Prof. Dr. med. Kurt Scheer. Dresden and Leipzig: T. Steinkopff. 1935. (Pp. 150; 19 figures. RM. 10; geb., RM. 11.)

[3] *Leçons de Physiologie Médico-Chirurgicale*. By Léon Binet. Paris: Masson et Cie. 1935. (Pp. 246; 53 figures, 4 coloured plates. 40 fr.)

[4] *Heredity: Mainly Human*. By Eldon Moore. London: Chapman and Hall Ltd. 1934. (Pp. 343. 15s. net.)

Sooner or later there is no doubt that in answer to the public demand a course in human genetics will be included in the medical curriculum. It seems likely that separate courses in botany and zoology will eventually be replaced by a co-ordinated course which will consist largely of an introduction to a biology, and genetics is an essential and important part of such a course. Following upon this, at a much later stage of the medical course, genetics will find a useful place in its application to problems of inheritance as a factor in the aetiology of disease as it affects the family and also the population as a whole. There are very many simply inherited conditions, though any one of them is rare in the population, and it is unlikely that any practitioner will be long in practice before he comes across a case concerning which his opinion, based upon his knowledge of human genetics, is asked. Problems involving questions of marriage, of the desirability of further children, and so forth, are perplexing, and much will often depend upon a rational opinion being given. A newly qualified practitioner should certainly know how to take a family history, where to seek information of what is known of the inheritance of the condition, and ultimately to give a considered judgement. The student whose attention is being continuously directed to questions of diagnosis and of treatment has little chance of forming a balanced judgement on the causation of such conditions and of the relative parts played by extrinsic and intrinsic factors and their interaction. Instruction in applied human genetics would help him to acquire such a balanced view, the lack of which is responsible for so many unjustifiable statements that are to be seen in the medical press.

But this is for the future. For the present the practitioner who seeks to equip himself with a sufficient knowledge of human genetics must turn to books upon the subject. This book of Mr. Moore's can be recommended. It is doubtful if his attempts to simplify the chromosome theory of organic inheritance for teaching purposes are wise, for simplication by the replacement of technical words with more familiar ones rarely succeeds. The author uses animals other than man for his examples and illustrations, but, in the main, he deals with man. The book is one of the best of its kind.

UNSOLVED PROBLEMS OF SCIENCE

Mr. A. W. HASLETT has developed an original and interesting line in his book with this title.[5] There is a steady output of works which tell of the marvellous conquests of modern science, but this deals with problems which science has hitherto failed to solve. The author has for the past five years acted as science correspondent to the *Morning Post*, and has a wide knowledge of very varied branches of science. The majority of the problems he examines concern physics, astronomy, and geology, but various biological problems are discussed. For example, there is a chapter entitled "Is Man a Machine?" which deals with some of the most recent discoveries in endocrinology and embryology. The author, indeed, ranges freely over the whole field of modern science, but thanks to his gift for clear exposition is able to set forth highly intricate problems in terms that can easily be followed by the general reader.

The final chapter, "Nature Beats the Scientist," contains many interesting suggestions. Mr. Haslett points out that man outstrips Nature chiefly in fields in which she does not try to compete. For example, man can produce chemicals of the highest degree of purity, but Nature seems to take no interest in such work, but has instead developed organisms that can use chemicals in an impure form. The aeroplane is more powerful and swifter than any bird, but the bird has far more versatility of movement and immunity from accident. Finally, the triumphs of modern medicine have been gained in a field in which Nature is not a competitor, because she has no interest in the preservation of the unfit.

As these few references indicate, the author's ideas are characterized by a fertility and an originality which make his volume both interesting and stimulating.

[5] *Unsolved Problems of Science*. By A. W. Haslett. London: G. Bell and Sons Ltd. 1935. (Pp. 308. 7s. 6d. net.)

Notes on Books

Electrokinetic Phenomena and their Application to Biology and Medicine,[6] by Dr. H. A. ABRAMSON, is a monograph belonging to the well-known series published by the American Chemical Society. The subject dealt with is one which will probably become of great importance in biology. Living cells are colloidal structures, and their behaviour can only be understood by a study of surface phenomena. Furthermore, the surfaces inside living organisms are of the solid-liquid and liquid-liquid types. The study of gas-solid and gas-liquid surfaces is in a relatively advanced state, but the study of solid-liquid and liquid-liquid surfaces is much more difficult, and electrokinetic methods offer one of the most promising means of approach. The author gives a history of electrochemistry, which is followed by an exposition of the modern theories regarding the factors that determine the electric charges on surfaces. The latter half of the book is devoted to a study of organic systems. Among other problems dealt with are the electric charges on red blood corpuscles, the effect on these of agglutinating agents, and the changes in the surface charges of bacteria produced by sensitization. In general, it may be said that the method promises in the future to provide most important information about the nature of cell surfaces.

Vol iii of the forty-fifth series of *International Clinics*[7] consists of three parts, devoted respectively to medicine, surgery, and recent progress in ophthalmology and otolaryngology. Among the eleven papers in the medical section attention may be drawn to those on idiopathic hypochromic anaemia, chronic benzol poisoning, arteriosclerotic heart disease, the relation of allergy to migraine, carcinoma telangiestaticum, and rheumatoid arthritis. The three surgical contributions deal with the indications for cholecystectomy, the unsolved problems of brain injury, and the practical aspects of the therapeutic problem in intestinal obstruction, with a note concerning the reaction accompanying conservative decompression by suction. The third part contains three papers devoted respectively to the ocular manifestations of blood diseases, the ocular manifestations of diabetes mellitus, and a review of radiology as applied to otolaryngological practice.

The third volume of HEFFTER'S Handbook of Pharmacology[8] is nearing completion, for its fourth part has just appeared, and this completes the original work except for a few odd articles and the general index. The final portion is expected to appear shortly. The bulk of the part under review is occupied by an article of 500 pages on bismuth, which has been compiled by Dr. Forst. In addition, there are short articles on the rare earths, molybdenum, and tungsten. The article on bismuth contains a full account of our knowledge of the action of this metal on living organisms. In particular, the fate of bismuth in the body is treated very fully.

[6] *Electrokinetic Phenomena and their Application to Biology and Medicine*. By Harold A. Abramson, M.D. New York: Reinhold Publishing Corporation; London: A. F. Bird. 1934. (Pp. 331; 106 figures. 7.50 dollars.)

[7] *International Clinics*. Vol. iii. Forty-fifth series. Edited by G. Louis Hamman, M.D. Philadelphia and London: J. B. Lippincott Company. 1935. (Four volumes, quarterly. 50s. net.)

[8] *Handbuch der Experimentellen Pharmakologie*. Herausgegeben von A. Heffter. Dritter Band, 4 Teil. Berlin: J. Springer. 1935. (Inlandpreis, RM. 64; Auslandpreis, RM. 48.)

The *Medicinal Index*, by Dr. M. T. SCHNIRER (Vienna, F. Deuticke, M. 4.60) is an annual publication which provides in two small pocket volumes a selection of various clinical data and a large amount of information about recent therapeutic advances. One of the features which English workers will find useful is a list of common drugs and dietetic preparations. This list, occupying 150 pages in double columns, includes the more important German proprietary preparations, and gives a short account of their composition.

In *First Aid for Everybody* (Faber and Faber, 2s. 6d.) Mr. A. J. B. GOLDSMITH, F.R.C.S., has aimed at providing an up-to-date account of the practice of simple first-aid based upon a simple understanding of the elements of human anatomy. He has achieved the difficult task of affording a brief but lucid description of the structures concerned, and the many diagrammatic illustrations are particularly useful in this respect. Special care has been taken to render the book easily readable, the typography and indexing being worthy of commendation—points often overlooked in books of this kind. In its wide outlook upon the many small accidents of daily life, their explanation, and the strictly first-aid measures described, this small and inexpensive volume represents a new departure, the needs of the public being primarily considered rather than the technique of treatment. It should receive a warm welcome.

E. and S. Livingstone have now published at 3s. 6d. (by post, 3s. 9d.) *Medical and D.P.H. Examination Papers, 1932–35*, being the questions set for the medical degrees of the University of Edinburgh and the diplomas of the Scottish Conjoint Board.

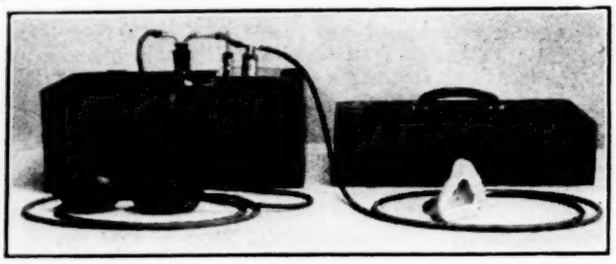
Preparations and Appliances

A PORTABLE ANAESTHETIC APPARATUS FOR SELF-ADMINISTRATION IN MIDWIFERY

Dr. R. FRANCIS JONES (Tamworth) writes:

For over two years I have used for midwifery a portable ether apparatus which, in my belief, has great advantages over others. I originally used a home-made contrivance, but the apparatus shown in the figure has now been made to my requirements by Messrs. Philip Harris and Co. of Birmingham, and is a finished and well-turned-out piece of equipment.

Description.—The apparatus is a modification of Shipway's ether apparatus, without a device for chloroform. The hot water is contained in a chromium-plated box, and the heat is



diffused by means of copper shavings around a standard one-pint bottle of ether. The face-piece is Tyrrell's. An important item is the provision of long unkinkable tubing from bulb to apparatus and from apparatus to patient, enabling it to be out of the way of patient, doctor, or nurse. The bayonet socket joints are non-reversible, so that pumping back of fluid ether on to the mask is impossible. A warning of the inflammability of ether near an open flame is attached.

Use of Apparatus.—As soon as the second stage of labour is reached the patient is told that by pumping and inhaling the vapour she can, within five minutes, control the pain. This is actually the case, and the patient's own statement afterwards invariably confirms this claim. The case can then be left for hours in charge of a nurse, and the only instructions necessary are (1) that only the patient is to do the pumping of the bellows, and (2) that the nurse must renew the hot water every hour or so to prevent the ether freezing. It will be evident that the hotter the water the less the pumping required.

Clinical Observations of its Use.—First, on oneself. I seriously consider that any doctor who uses this apparatus should anaesthetize, or, to coin a word, analgesize, himself. He should, after an ordinary meal (to make the test more severe), lie down, and determine to pump the bellows and inhale the ether until he is too intoxicated to pump any longer. In a few moments, pumping reasonably hard, he will have lost his inhibitions and dulled his more sensitive and highly educated olfactory sensations, and will experience a greater confidence and a light-heartedness and exhilaration. After five minutes or so he will be too intoxicated to pump any longer, unless goaded by severe pain. I have confirmed these observations on myself, and on several of my medical and lay friends.

Effect on Patients.—The results are so uniformly satisfactory that I am surprised that such a simple device has not long ago supplanted chloroform by Junker apparatus, with its attendant anxiety about cessation of contractions, post-partum haemorrhage, and delayed chloroform poisoning. My experience is that it is impossible to produce ill effects through over-prolongation of the anaesthetic. I have had patients who, by reason of contracted pelvis or occipito-posterior presentation, have kept themselves under analgesia, with sleep between pains, for as long as eight hours. Such a procedure would be dreaded with chloroform or "mixture." Up to this point my remarks have been about the use of the apparatus as an analgesic—the patient doing all the pumping herself. When the head is being expelled, or when instrumentation is required, it is perfectly simple to go on to deep anaesthesia: the nurse simply takes on the pumping instead of the patient. I have repeatedly induced anaesthesia for men and women patients for ordinary operations by this method. I merely instruct the patient to pump and to inhale, and having thus got through the nervous and intoxicated stage I have taken control of the pumping, and have proceeded to indefinitely long, deep anaesthesia.

My opinion of the great value of this method is shared by my partner, Dr. P. W. Parkes, who endorses all my claims. I am indebted to Professor Beckwith Whitehouse, who has anaesthetized himself and testified to the above description of its effects. He also testifies to its value in midwifery in terms which are materially identical with mine.

Summary and Conclusions

To summarize these observations and claims: (1) The apparatus is simple, portable, and economical. (2) It is foolproof, and in my opinion is without danger even in the hands of an inexperienced midwife. (3) It is suitable for prolonged administration, and on that account it is invaluable for all cases of obstructed labour where prolonged natural labour is safer than resort to forceps. (4) It is now a truism, supported by statistics, to say "avoid forceps if possible." This counsel of perfection, however, often becomes impracticable in view of the entreaties of the patient, and the pressure and criticism of anxious relatives. This method does away with this dilemma by conferring sleep and abolishing the anxiety of patient and relatives. (5) The prolonged use of ether causes no increased tendency to post-partum haemorrhage.

The publicity on these matters to-day has created in women's minds an apprehension which is not conducive to normal labour. The use of self-administered ether dispels apprehension and nervousness completely, even as it less completely abolishes pain.

AN ADJUSTABLE FOUNTAIN-PEN NIB

The Wahl Eversharp Company Ltd. (195–199, Great Portland Street, W.1) have sent us a specimen of their "one-shot" self-filling fountain pen, which has a small attachment to the nib whereby its flexibility can be varied to suit the writer's taste or purpose. This slide is adjustable up or down to nine different flexibilities, so that a doctor, for example, who prefers a soft pen for ordinary correspondence can harden the point and decrease the flow of ink if he wishes to manifold, as when writing a prescription in duplicate. Similarly, the nib can be varied to suit a rough or a smooth paper. The "Eversharp adjustable" pen has a large ink capacity, the amount being visible on holding the barrel to the light; and an automatic shut-off beneath the nib prevents leakage when the cap is screwed on.

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SATURDAY, NOVEMBER 30th, 1935

THYROTOXICOSIS

Consideration of the problems of thyrotoxicosis formed the subject of the combined meeting of the Medical and Surgical Sections of the British Medical Association held in Melbourne. A short report of the discussion has already appeared in the *Journal*[1], and the opening papers are published in this week's issue. Lord Horder, in his broad-minded review of present-day knowledge of the subject, while making due allowance for the strides made by research and clinical observation, did not hesitate to indicate where the structure was weak and where there were considerable lacunae still to be filled in. The very name thyrotoxicosis is founded on a misconception of the nature of the peccant thyroid secretion, for this can no longer be regarded as other than an exaggeration of the normal secretion of the gland, thyroxine, which has been isolated and even synthetically prepared. Though Plummer's observation, that iodine has a remarkable effect in reducing the effects of "thyrotoxicosis," has been substantiated by world-wide clinical experience, there is considerable difficulty in determining the mutual relationship that exists between the iodine brought to the gland, the colloid stored in the acini of the thyroid, and the thyroxine discharged into the blood. That the thyroid indeed is primarily at fault is open to doubt.

Hyperplasia of the gland which is compensatory and in a sense physiological occurs at adolescence and at other times of stress, but this hyperplasia is not necessarily or evenly commonly associated with symptoms of hyperthyroidism. The hyperplasia may subside with varying degrees of involution, to arise again in response to stimuli, such as infections, deficiency of vitamin or iodine intake, and activities of the sex organs. The real problem still requiring solution is why in some cases the hyperplasia should be pathological rather than physiological; why it should be continuous and excessive, bearing no apparent relation to the needs of the body and with repercussions on other organs that are often disastrous. In these cases it would appear as if some irritant, perhaps toxic in nature, were whipping the gland into a state of feverish activity. What is it that puts the accelerator on and holds it on? Lord Horder has been very disappointed in the search for focal sepsis in Graves's disease, however thorough the search may have been. In his experience the exciting causes are the sex epochs and psychic traumata. But there is probably also a constitutional factor, which may be hereditary. There appears to be an abnormal speeding up of the metabolic processes of the somatic cells, especially those of the muscles. Biochemical experiments show that alterations of the hydrogen-ion concentration in the tissue fluids have profound effects on the rate of oxygen consumption, and changes in the electrolyte content of the fluid are brought about by iodine. There may be, or develop, a fundamental peripheral state which calls for more and more thyroid secretion to stay the ill effects. The hypertrophy and hyperplasia so produced pours more thyroid secretion into the circulation, thus affecting the heart, the peripheral vessels, and the nervous system, bringing about thyrotoxic heart, thyrogenic hypertension, tremor, and psychic symptoms. Whatever the clinical varieties met with, the modern tendency is to view them as examples of one disease process, with halts and relapses.

While, however, the essential cause eludes us at present, two immediate duties lie to our hand: to prosecute research on all sides of this important and interesting problem, and to reduce, so far as possible, the ill effects of the abundant thyroid secretion on other vital organs in affected patients. Sir Thomas Dunhill, a leading exponent of the art of surgery as applied to this complaint, was able to review his experiences and assess his results at the site where his first tentative experiments were begun thirty years ago. Early he was led to feel that control of the disease could only be obtained by adequate resection of both lobes of the thyroid gland, and his first successes were published in 1908. During the intervening period his judgement has grown more assured, his technique has improved, and his results have become commensurately better. From his wide experience he is compelled to sound a note of caution. "It cannot be emphasized too much that some patients cannot be made safe for surgery; and the sooner the word 'cure' is dropped in this disease the better." Yet the figures he brings forward of his own cases show that much may be done for the patients even in the presence of severe complications—cardiovascular disorders, glycosuria, mental derangement, extreme emaciation, and pruritus. Operation—subtotal thyroidectomy—is necessary, but must be carried out early. The time at which operation is performed has steadily been advanced. Is it even now done early enough to prevent the patient sliding under the weight of his or her complications? We are reminded of one of the aphorisms of Sir Thomas Dunhill's old teacher of surgery, the late Dougan Bird: "Gentlemen, I am not afraid of you cutting too deep; all I fear is that you will not cut soon enough."

In regard to further research, the New Zealand contributors to the discussion at Melbourne were able to point out the undoubted improvement in the physical state of patients whose thyroid reacts to the stresses of life by physiological hypertrophy and hyperplasia, when they are given treatment with iodine. Is it too much to expect, as Professor Drennan said, that increased acumen in diagnosis and knowledge of means of treatment may find measures to prevent goitrous disease and its consequent thyrotoxicosis?

[1] *British Medical Journal*, October 26th, 1935, p. 798.

ORGANIZATION OF CANCER RESEARCH

It is generally supposed that the temperament of the research worker resembles that of the artist. When he feels the breath of inspiration he must be allowed to follow his own bent undisturbed by economic anxieties and to a large extent regardless of the advice or standards of others. If this is so, it would seem a dangerous policy to suggest anything very detailed in the nature of co-ordination or organization of research lest the precious liberty of thought and action be restricted. There is, however, a special need for some sort of supervision of research, since the pure scientist is often dependent on the support of the community, and the Medical Research Council has set an example of how research work may be organized without curtailment of individual liberty. The organization and co-ordination of research work on malignant disease has always been one of the aims of the British Empire Cancer Campaign. At the time of its inauguration in 1923 representations were made by the Royal Society and the Medical Research Council that it would be for the benefit of cancer research generally if the Campaign would set up a committee jointly with these two scientific organizations to advise and report to it upon steps to be taken in relation to research work and upon the allotment of money for this purpose. As a result the Scientific Advisory Committee of the Campaign was formed. Its membership was limited to ten, five of whom were nominated jointly by the Royal Society and the Medical Research Council and five by the Campaign itself. An account of some of the activities of this committee has been given in the successive annual reports of the British Empire Cancer Campaign. Its work receives special mention in the recently issued twelfth annual report, presented at the meeting held at the House of Lords on November 25th.

Early in 1934 a suggestion was made by the Grand Council that the Scientific Advisory Committee should undertake a survey of cancer research wherever it was found practicable or desirable. The first step taken was the formation of four subcommittees—biological, biochemical, physical, and tissue culture—the membership of these consisting of representatives skilled in the work of each of these branches of science. No doubt the deliberations of these special subcommittees will lead to valuable decisions in the future. In the meanwhile arrangements have been made for the prosecution of research work in certain directions in which the need for further knowledge seems particularly pressing. Thus on the biological side the first problems to be dealt with have been the nature of the filterable agent in sarcoma and the biochemical nature of tumour-producing viruses. Two whole-time research workers, supported by grants from the Campaign, are now investigating these problems. Also, inquiry into the action of short-wave radiations on normal and malignant tissues has been instituted. The Physical Subcommittee is planning a study of the action of radiations on colloids and of the biological reactions of monochromatic radiations of various wave-lengths. These are encouraging examples of how research work can be fostered by far-sighted organization, but perhaps an even better instance is shown by the steps now being taken to further what is known as "clinical cancer research." During the past year meetings have been held between representatives of most of the London teaching hospitals, special hospitals, and medical services of the London County Council with a view to co-ordinating clinical research on cancer. The preliminary discussions point to the desirability of some uniform system of keeping records in different hospitals, particularly for the purpose of the "follow-up." It is to be hoped that one of the activities of the new General Clinical Research Committee will be to encourage all hospitals to adopt a proper "follow-up" system for all cases of malignant disease.

In these remarks on the twelfth report of the British Empire Cancer Campaign attention has been drawn to the questions of organization and co-ordination. The chief part of the report is naturally a record of research carried out by workers receiving grants from the Campaign. These investigations cover a very wide field, ranging from studies in carcinogenic agents to statistical records of different forms of cancer therapy. The year under review has not been distinguished by any important discovery, but although the major problems of aetiology and therapy remain unsolved, there is no doubt that the research work of the last few years has led to a better understanding of the clinical pathology of cancer. In some cases, as, for instance, in the malignant growths of the rectum and colon, this more accurate knowledge of early manifestations and spread is already leading to improvement in the results of surgical treatment.

VOLUNTARY EUTHANASIA

We printed on November 2nd (p. 856) a summary of the declared aims of the Euthanasia Legalization Society and the provisions of the Bill which Lord Moynihan, its president, hopes to introduce into the House of Lords next session. The proposal is not altogether novel, for readers of the medical journals and possibly also of lay newspapers are familiar with the efforts which Dr. C. Killick Millard has been making for several years to win public support for a Bill which would make it lawful to put to death, in the most merciful way, a person who desired to die because of incurable and painful disease or injury. The supporters of the movement lay emphasis on the need for the strictest possible safeguards and the consent of all private persons and public authorities concerned, given after the fullest investigation. As the law stands at present, wilfully to hasten the death of a person even by an hour or a minute is murder, no matter how merciful and disinterested the motive. Not only a new law, but a wholly new concept in the mind of society,

would be necessary before euthanasia could be accepted. The arguments of its advocates were set forth at some length in the memorandum published on November 2nd: in brief, they are that a person whose life becomes intolerable to himself by reason of incurable suffering should have a right to end his life, and that his friends and relatives should have a right to assist him to do so. Every humane person feels it his duty to relieve suffering, they say, and this is a means which the law should not forbid him to employ. The opponents of voluntary euthanasia declare that to admit the principle would be extremely undesirable. Many hold strongly on religious grounds that no human being has a right to take the life of another, though they may make an exception in the case of capital punishment and in that of the soldier in time of war acting under military orders. Others see in the adoption of the principle a great danger. While they might be willing to approve its application to a particular incurable patient or a particular deformed infant, they fear its extension to other persons who cannot express valid consent: first, incurable insane persons without volition; secondly, aged persons who are wearisome to their relatives; and lastly, perhaps, any individual who a majority of interested persons might consider would be better dead. Others, again, while favouring in theory a permissive measure provided that it is well safeguarded against abuse, shrink from the practical issue which would impose upon one branch of the community—the medical profession—the duty of acting in effect as both "judge and executioner," since the question of incurability would be for doctors to decide and a doctor would have to carry out the "sentence."

Those who sincerely deny the right to kill in any circumstances whatsoever should also, to be logical, oppose the law which inflicts capital punishment; some of those who agree with capital punishment because it is authorized by law would presumably find their objection to euthanasia removed if Parliament passed Lord Moynihan's Bill. There is no need for us to lay stress upon the strong public opinion which undoubtedly opposes the movement, both within the medical profession and outside, but it would be shutting our eyes to facts if we denied the existence to-day of a strong though little-expressed public opinion in favour of it. Three or four weeks ago a young woman was tried at the Old Bailey for murdering her mother, a victim of general paralysis of the insane, by giving her a large dose of a barbiturate in some peppermint creams. The evidence showed that she had admitted giving her mother the drug with the object of taking her life in order to end her sufferings. Mr. Norman Birkett, defending her, urged that there was no conclusive evidence connecting this drug with the death, which was due to bronchopneumonia. Mr. Justice Goddard warned the jury that intentional killing was murder and that sympathy had no place in a verdict but only in a recommendation to mercy; he added that sympathy would be felt keenly by the judge if the verdict was adverse, for he then had a duty to perform. The jury's verdict of "Not guilty" is difficult to justify on the evidence and summing-up, and may not improperly be ascribed to a sympathetic basis. Only the other day a coroner investigated the death of a young couple from arsenic poisoning. The husband was on the point of death from tuberculosis and the wife poisoned him with his consent and took her own life in order that they might not be parted. So far from condemning her action as against law and good conscience, the foreman of the jury and the coroner expressed reverent praise for her courage and self-sacrifice. When responsible persons express on public occasions powerful sentiments which are directly contrary to law, some legislators will no doubt ask themselves whether they are willing to bear the responsibility of a flat refusal to change the law.

Lord Moynihan's Bill raises an issue which must lead to widespread interest and controversy, involving as it does an ethical principle of such magnitude. It is impossible for members of the medical profession, holding widely different religious and ethical convictions as private persons, and witnessing week in and week out so much human suffering, not to feel themselves vitally concerned with the formidable problem that this Bill has put before them. And we suggest that no satisfactory solution will be reached unless doctors, and the lay public, can bring themselves to view the matter dispassionately and objectively.

COMMITTEE OF EXPERTS ON NUTRITION

The resolution on nutrition, unanimously accepted by the League Assembly, calling for a thorough inquiry into improved nutrition from the point of view both of national public health and of world agriculture, has been followed up by the appointment by the Health Committee of an expert committee, which has been holding meetings throughout this week at the London School of Hygiene and Tropical Medicine. Professor Edward Mellanby was appointed chairman, and Professor E. V. McCollum of Johns Hopkins University vice-chairman. The other delegates are:

France: Professor L. Alquier, Directeur de l'Institut d'Hygiène Alimentaire, Paris; Dr. Louis Lapicque, Professor of Physiology at the Laboratory of Physiology, Sorbonne, Paris. *Scandinavia:* Professor Axel Hojer, Generaldirektor, Medicinalstyrelsen, Vallingatan 2, Stockholm. *United Kingdom:* Dr. E. P. Cathcart, Regius Professor of Physiology, Glasgow University; Sir John Boyd Orr, Director of the Imperial Bureau of Animal Nutrition, Reid Library, Rowett Institute, Aberdeen. *United States:* Dr. Mary Schwartz Rose, Columbia University, New York; Dr. W. Sebrell, Chief of the Department of Nutrition, National Institute of Hygiene, Washington, D.C. *U.S.S.R.:* Professor Sbarsky, Director of the Central Nutrition Institute, Moscow.

The Commission has decided to draft a statement on the scientific principles governing dietaries of certain population groups: women during pregnancy and lactation; infants; school children; and adolescents up to the age of 21. Two subcommittees have been formed to draw up detailed recommendations, which will be submitted at a later meeting. One subcommittee (under the chairmanship of Professor Cathcart and with the following members: Professors Alquier,

Lapicque, Sbarsky, and Sebrell, with Dr. McGee of the Ministry of Health as secretary) will consider the question of energy-producing substances ; and the other (under the chairmanship of Professor McCollum and the following members: Professors Hojer and Mellanby, Sir John Boyd Orr, and Dr. Schwartz Rose, with Dr. Harriette Chick of the Lister Institute as secretary) the question of non-energy-producing substances. The report of this Commission will be awaited with great interest. Such work is a valuable example of international co-operation, under the auspices of the League of Nations, on a matter of world-wide importance.

CARBO-GASEOUS BATHS AND THEIR ACTION

That certain mineral waters highly charged with carbon dioxide gas exercise a powerful influence on the peripheral circulation has long been known. Various theories in explanation of this effect have been advanced, based for the most part on stimulation of the peripheral nerve endings by the mechanical effect of the minute bubbles of gas impinging on the skin. Many of the mineral waters used for the purpose are strongly saline, and this character produces a further stimulating or mildly irritative effect. These theories based on chemical observation only are inadequate, and modern medicine rightly demands that scientific investigation must be brought to bear in support of the claims made. This has produced interesting results, as was shown in the discussion on the action of baths of carbo-gaseous water on the peripheral circulation at the annual meeting of the International Society of Medical Hydrology recently held in Brussels. Dr. Marcel Wybauw approached the subject from the physiological aspect and studied the effect of baths of carbo-gaseous waters at a neutral temperature in order to avoid possible influences of heat or cold. The favourable effect on the cutaneous circulation due to percussion of the minute bubbles of gases is noted as equivalent to that resulting from a bath in which effervescence is produced by driving in air, but the effect of the CO_2 bath appears to go beyond this and is believed to arise from the passage of the CO_2 through the skin and its entry thus into the blood stream. That this occurs has been demonstrated by many observers and in a variety of ways, attention being paid to the possibility of error owing to the constant variations of gaseous exchange in the organism due to influences both internal and external. The details of these investigations cannot be given here, but are worthy of study in the reports, and they have been confirmed by Groedel, Wachter, and Mougeot, with the strictest attention to technique. Where the gases contained in the water are radio-active the presence of radio-activity in the exhaled air has been demonstrated by Mougeot, an observation of much importance in the study of the mode of action of mineral waters used externally. The amount of CO_2 which can thus enter the system has been variously estimated at from 30 to 200 c.cm. per minute. It speedily diffuses through the tissues, but whether the pH can thus be modified in spite of the action of buffers is open to question: the point is of importance, as it is known that an increase in the hydrogen-ion concentration has a vaso-dilator action. The theory is advanced by Bornstein that the effect is to liberate in the tissues a vaso-dilator hormone related to histamine (H-substance). Further, the excitation of the terminal filaments of the parasympathetic nerves sets free a substance analogous to acetylcholine. This substance has been recovered from the skin after a local hot bath by Gollwitzer-Meier and Bingel. The principal effects to be observed clinically are vaso-dilatation of the cutaneous circulaton, increased cardiac output, slowing of the pulse, and lowering of the blood pressure. These have been made the subject of careful experiment and observation by Guilleaume, Deschamps, Vogt, and Wachter, who reported their results at the same meeting: they arrived at similar conclusions, with slight variations due to differences in experimental conditions. Wybauw questions whether the action is limited to the cutaneous circulation and believes it may extend to the whole of the systemic arterioles as a result of a rise in the concentration of arterial CO_2, a hypothesis calling for further research. The effect appears to increase with successive baths, and a lowering of the blood pressure lasting for some months may result from a course in suitable cases. The treatment is also of service in spasmodic conditions of the peripheral circulation.

RECURRENT PAROTID SWELLINGS

Allergy is perhaps being worked too hard as an explanation for a wide group of disorders, and to add to an already long list R. Bruce Pearson, in the current issue of the *Archives of Disease in Childhood*,[1] brings forward some suggestive evidence that recurrent swellings of the parotid glands may be allergic in origin. A type of such recurrent swelling due to infection of the glands or their ducts has been previously described, but in Pearson's series of cases infection seemed to play but a small part in the aetiology. The main clinical features can be summarized as follows. The majority of the cases are children, more males than females. Without any obvious predisposing cause the swelling quickly appears, affects one or both glands, involving the whole gland, and may last for only half an hour or for several days. The exciting cause in many cases seems to be the taking of food, and acid foods in particular are often mentioned as precipitating factors. While a feeling of tension and pain is usually experienced in the swollen gland this was often absent, pressure could be applied without causing pain, and there was no reddening of the superficial skin. The openings of Stenson's ducts are not reddened, and when saliva is seen to escape it is always clear during the swelling of the glands. *X*-ray examination of the parotid glands after introduction of lipiodol into the ducts showed terminal dilatation in some cases and a normal sialogram in others. The evidence for the allergic origin of these parotid swellings is summed up by the following facts. There were frequently other allergic disturbances in the same patients or in their relatives ; the attacks coincided with other allergic phenomena in three cases ; there were eosinophil-containing plugs in the ducts of one case ; the swellings appeared abruptly and were frequently bilateral ; and there was apparent absence of infection. Pearson contrasts his findings with similar findings of other observers, and adds records of six instances of recurrent parotid swellings clearly due to

[1] October, 1935, p. 363.

infection. In these, turbid saliva was the usual finding there was often pyrexia during the attacks, and local heat and tenderness were also found in four, with a reddened orifice of Stenson's duct in three. Possible explanations for the allergic type of parotid swelling are that there is obstruction of the duct by spasm, oedema of the lining membrane, or the presence of abnormally viscid saliva or mucus plugs. Stone can be excluded, and it seems clear that infection has been satisfactorily set aside as a cause in the present group of cases.

PILGRIMAGE TO THE HOLY PLACES

A report of the pilgrimage to the Hedjaz (Mecca and Medina) in 1935 has been published by the Conseil Sanitaire Maritime et Quarantenaire d'Egypte, the office of which is at Alexandria. By the sea route there travelled 33,898 pilgrims as compared with 22,717 in 1934, and it is recorded with pride that the health and sanitary conditions were very satisfactory. There was an increase in the number of those who made use of the improved automobile transport between Baghdad and Medina, and corresponding intensified precautions were necessary against epidemic infections. The report (written in French) comprises details of the various journeys and of the sanitary regulations which were enforced. It is well illustrated by photographs, maps, and tabulated statistics, showing how greatly the circumstances of the pilgrimage as a whole have been improved in modern times, and especially in the last year or two. One aerial photograph of a camp site is reminiscent of old illustrations of the journey of the Israelites under Moses to the Promised Land. There was a slight relative increase in the number of pilgrims admitted to hospitals this year as compared with previous ones, but the total figure of 100 is surprisingly small nevertheless, and only three cases were serious. A mixed anti-dysenteric and anti-cholera bacteriophage proved effective in dealing with certain carriers of these two diseases. The report includes details of the laboratory procedures employed for the examination of stools, and one of the difficulties of the authorities is revealed in the mention of an alarming though baseless rumour of cholera infection which originated from a systematic examination of a shipload of pilgrims, necessitating their temporary detention until the results could be obtained. The measures taken by the various Governments concerned in the transport of pilgrims through their territories reveal the working of a fine, co-ordinated scheme of prophylaxis, and show how modern scientific discoveries have made it possible now to prevent the outbreak of epidemics which have in the past proved most disastrous. The whole report is a model of clarity as well as of comprehensive documentation.

ALTERATION OF A HOSPITAL'S OBJECTS

The National Anti-Vivisection and Battersea General Hospital was founded with the object of maintaining a general hospital in London for medical and surgical treatment with power to take paying patients. No vivisectionist could be a member of the board or staff ; no remedies which were the result of any experiments on animals might be used in it ; and each member of the staff had, on joining, to sign a declaration against vivisection. It was incorporated as a company and given licence to dispense with the word "limited." On November 19th its directors petitioned the Chancery Division of the High Court to sanction the alteration of its objects, and asked approval of a scheme of regulation. Counsel for the hospital explained that it had become impossible to carry on the work unless its special objects were abandoned. It could not give up-to-date scientific treatment for certain diseases such as diphtheria because the use of the essential antitoxins was forbidden. Counsel for the trustees of the charter added that if the changes were not allowed the hospital must be wound up. Since 1929 there had been a deficiency of income every year, particularly income from legacies. The assets were considerably more than the liabilities, but could not be realized without winding up. Already three wards containing a hundred beds had been closed. He read an affidavit by Mr. J. R. Lee, the senior honorary surgeon, saying that in view of the general advance of medical knowledge it was quite impossible to run the hospital on the present anti-vivisection lines. No other hospital in England was administered on these principles. Mr. Justice Eve sanctioned the change of name to "Battersea General Hospital." He said that, though personally he sympathized with the original objects of the hospital, it was quite obvious that they were no longer practicable. He made an order sanctioning the change of name and of objects. The institution is therefore now free to carry on as a general hospital without any restriction upon the remedies it may use.

DR. A. D. MACPHERSON

Dr. A. D. Macpherson entered the service of the British Medical Association in December, 1904, when the medical secretariat in the old building in the Strand was beginning to take shape under the new constitution. To-day, after thirty-one years' devoted work at headquarters, he leaves the Medical Department on attaining the age fixed by the Council for retirement of its officials. At last week's Council meeting the Chairman, Dr. Le Fleming, conveyed to Dr. Macpherson the thanks of the Council for his long and valuable services and its good wishes for the leisure he has so well earned ; and on behalf of his colleagues we would like to express the same feeling. Dr. Macpherson's invariable courtesy and helpfulness must be known to very many correspondents and visitors at headquarters ; his mastery of detail and of constitutional procedure and his whole-hearted loyalty to the Association were qualities that could only be appreciated by those working in close touch with him at the centre of the machine. We wish him happiness in the name of all his friends at Tavistock Square.

The Bradshaw Lecture before the Royal College of Surgeons of England will be given by Professor Grey Turner on Thursday, December 5th: his subject is "Carcinoma of the Oesophagus." The Thomas Vicary Lecture will be given on December 12th by Dr. Cecil Wall: subject, "The Surgeons' Company, 1745–1800." Each lecture begins at 5 p.m., and tea will be served beforehand.

TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some diseases of the nervous system met with in general practice.

SUBACUTE COMBINED DEGENERATION

BY

W. RUSSELL BRAIN, D.M., F.R.C.P.

Figures published by the Registrar-General show that the deaths from subacute combined degeneration in 1933 were almost double those in 1927, the year before that in which liver treatment of pernicious anaemia came into general use. It appears that patients who would formerly have died of pernicious anaemia are now being kept alive long enough to die of subacute combined degeneration. Since, subject to certain precautions, "a patient with pernicious anaemia probably has the same expectation of life and physical well-being as his fellow-men" (Witts), most if not all of these deaths from subacute combined degeneration could have been prevented by adequate treatment. Though the relation between pernicious anaemia and subacute combined degeneration is not altogether clear, it may be regarded as proved that the latter can be prevented by giving the patient with pernicious anaemia adequate doses of liver or liver extract, and when subacute combined degeneration has already developed improvement can be brought about by the same means, though the dose required will be much larger than that which is effective to maintain the blood picture normal.

There is evidence that in subacute combined degeneration the cerebral hemispheres, the spinal cord, and the peripheral nerves may all be affected. The degeneration of the lateral columns of the spinal cord is responsible for spastic weakness, most marked in or confined to the lower limbs, with exaggerated knee- and ankle-jerks and bilateral extensor plantar responses. Degeneration of the posterior columns leads to impairment of appreciation of posture, passive movement, and the vibration of a tuning-fork in the limbs. Degeneration of the peripheral nerves is responsible for the characteristic early symptom of numbness and tingling in the toes and fingers, for anaesthesia and analgesia of the "glove and stocking" type, for the muscular wasting of the periphery of the limbs in some cases, and for diminution or loss of the tendon reflexes, thus counteracting the effect upon them of the lesion of the pyramidal tract. In advanced cases the combined effect of the degeneration of the spinal cord and peripheral nerves is severe weakness and ataxia of both upper and lower limbs. Most of the improvement which follows treatment with liver probably occurs in the peripheral nerves, which are capable of regeneration, other parts of the nervous system being capable of improving only so far as irreversible changes have not taken place.

Treatment with Liver and Liver Extract

The patient who has already developed subacute combined degeneration requires very large doses of liver or liver extract. It is necessary, therefore, to inject liver extract parenterally. The relative value, and hence the equivalent dosage, of liver extract prepared by different methods is not yet settled. I employ Gänsslen's extract (campolon), which is given by intramuscular injection three times a week, the total weekly dose being usually from 20 to 30 c.cm. This is continued, if necessary, for several months, until it is thought that the maximal clinical improvement has been obtained, the achievement of a normal red blood count not being regarded as any index of the adequacy of the dose for the improvement of nervous symptoms.

When it seems impossible to produce any further improvement the patient is put upon a maintenance dose either of raw liver pulp or of liver extract given by intramuscular injection, there being some doubt as to the value of the oral administration of liver extract in the treatment and prevention of subacute combined degeneration. The maintenance dose must be found by experience, the minimum dose of raw liver pulp being 2 to 2½ lb. a week and that for intramuscular injection about 5 c.cm. of extract. Sometimes the patient can be kept in good health by a single intramuscular dose at intervals of two or three weeks. Any increase in the neurological symptoms, especially in the paraesthesiae, numbness, and tingling in the toes and fingers, is an indication that the dosage of liver or liver extract is inadequate.

Treatment with Other Substances

There is evidence that stomach extract is effective in the prevention and treatment of subacute combined degeneration. The adequate dose must be found by experiment.

Brain has been shown to be more effective in the treatment of subacute combined degeneration than in that of pernicious anaemia, and has produced clinical improvement in doses of 480 grams of raw ox brain daily.

Good results have been claimed for iron in doses of 150 grains of pil. ferri daily as a powder in capsules, but this method of treatment has not yet come into general use.

Though there is evidence that lack of vitamin A and of the vitamin B complex may be followed by degenerative changes in the nervous system, these vitamins alone are ineffective in the treatment of subacute combined degeneration. Mammalian liver contains large amounts of vitamin A. The vitamin B complex, which may have some value as accessory to liver treatment, may be given in the form of marmite, half an ounce daily, on bread-and-butter, or as soup.

The administration of dilute hydrochloric acid is not essential to recovery, but may be helpful in relieving dyspeptic symptoms. One drachm of dilute hydrochloric acid, well diluted with water and flavoured with syrup of lemon, is administered three times a day with meals.

Accessory Treatment

The removal of focal sepsis is important, since, as in diabetes, this may largely diminish the reaction to the specific treatment. Re-educational exercises, especially in walking, are of the greatest value, and form an essential part of the treatment. When a severe degree of polyneuritis is present a pair of light night-shoes should be worn, and light splints to prevent wrist-drop. Gentle passive movements should be carried out daily at all joints of the limbs to prevent the development of contractures. When the lesions of the spinal cord are severe enough to cause paraplegia, the skin, bladder, and rectum will require special attention (see article by Dr. Henry Cohen, October 5th, p. 633).

LIFE THROUGH A LABORATORY WINDOW

BY

SIR ARTHUR KEITH, M.D., F.R.S.

My friend Dr. Raymond Pearl has drawn a comparison between Dr. Carrel's *Man, The Unknown*,[1] and Carlyle's *Sartor Resartus*, adding that "in some respects" the former "is the better book." There are some resemblances of a metaphysical kind, but the differences between them are profound. The life which Dr. Carrel describes is that seen through a laboratory window which looks out on the sophisticated life of New York, whereas Carlyle's study window opened out on the wind-swept moors of Craigenputtock. Dr. Carrel sees the world through a film of "tissue culture," Carlyle saw it through the mystical haze of a Calvinistic philosophy. It is true that in both cases we have to deal with disgruntled men who suffer from some strange form of mental astigmatism; both have assumed the mantle of Jeremiah in the midst of a world which they conceive to be evil. Carrel, like Carlyle, is a hero-worshipper and a contemner of democracies. Carrel, like Carlyle, believes humanity has to be retailored, but, unlike Carlyle, he thinks the new suit must be cut under scientific guidance.

A Comparison with Metchnikoff

The book with which I prefer to compare *Man, The Unknown* is one written fully thirty years ago by Elié Metchnikoff. He named it *The Nature of Man*. It is strange that the one book was written by a Russian biologist who made his home in France, while the other is from the hand of a French biologist who has spent his working life in America. It is true Dr. Carrel claims to be a surgeon; like Lord Moynihan, he speaks of the god-like office of the surgeon; but nevertheless, like all great surgeons, he is at heart a biologist, and, as we now know, also a philosopher. So was Metchnikoff, but Carrel's philosophy is more robust and all-embracing. Metchnikoff was convinced that the evolution of civilization had far outstripped that of man's body and called in the surgeon to remove the big bowel and other parts which he believed to have become superfluous. Dr. Carrel's diagnosis is different: he is convinced that man's body is still sound, but that he has surrounded himself with a civilization that is suffocating him—squeezing out his intelligence, his morality, his personality, and his happiness. He proposes to reform humanity by calling in, not a surgeon, but a junta of superphysicians. The reformers are to be segregated in a superinstitute, modelled on the lines of the Rockefeller Institute for Medical Research in New York; they are to elaborate and apply a science of morals as well as the other sciences which normally fall within the purview of modern medicine. They have to see to it that "mind" stands above "matter," that men and women imprisoned in big factories and offices are set free to work out their "personalities." Our reformers are to think, not of the advancement of material things, but of man's progress. How far the super-institute is to replace our regularly constituted Governments is not disclosed. The cause of reform is also to be aided by a voluntary fascist organization—of a kind which has been so successful of late in Italy, Germany, and Russia. Also the cause will be assisted by eugenical measures—such as we have been made familiar with in Britain since the time of Francis Galton.

Alexis Carrel's Career

Viewed across the width of the Atlantic we had judged Dr. Carrel to be the most fortunate of men. We supposed him to be the last of all men to find fault with our civilization, seeing that it was able, just when his time came, to open the door of opportunity to his budding genius. Let us consider his career for a moment. Born in France and bred to medicine in the University of Lyons, he found himself in New York in 1905. He was then 32 years of age. The doors of the Rockefeller Institute of Medical Research were thrown open to him. This institute, the creation of modern civilization, with its big regimented businesses, provided the opportunities which Dr. Carrel stood in need of in 1905. By 1912 he had established his fame. In that year, while Dr. Carrel was still under 40 years of age, he was awarded a Nobel prize for his work on the suturing of wounded blood vessels and on the maintenance of life in organs and parts removed from the living body. Again, he was benefited by the munificence of an industrial magnate. Plainly, when Dr. Carrel wishes to annihilate the modern organization of industry he cannot be moved by any personal grudge. Still, for the sake of future Carrels we do hope that he will defer his plans for economic revolution. Even his super-institute for world reform will depend on big business for its maintenance.

Alexis Carrel's Beliefs

Let no one lose heart over the aridity of the earlier chapters. Presently come those which are green and fertile. In these Dr. Carrel, in the clearest of phrases, expounds the new aspects of living matter which have been revealed to him in his laboratory. Every fact cited is one which he can demonstrate, every result mentioned is one capable of verification. His methods relied on in these fertile chapters are those regarded as valid by all men of science. But presently readers will find themselves in realms where the writ of science is not yet valid—where faith rules rather than fact. Dr. Carrel will have his readers believe that there are men who come by powers such as are usually reserved for the deity—namely, those of "reading the thoughts as easily as faces," of seeing future events while they are still hid in the womb of time, of sending and delivering mental messages to friends on the other side of the earth. Dr. Carrel is convinced that prayer can cause a wound to heal at a much quicker rate than is normal, and that the patient need not participate in the supplication to gain such gratifying results. Yet although a follower of Richet he apparently does not believe in the existence of spirits nor in the supernatural powers of mediums. He is inclined to believe that the brain may be capable of throwing out waves which may prove to be akin to electro-magnetic waves. He believes in asceticism and in mysticism; fasting is advocated as an exercise in mental therapeutics. Dr. Carrel believes in the existence of a psychic principle, capable of evolving outside the living human body. He believes that genuine miracles do happen; mystics can work them. And yet, strange to say, he regards the human soul as being inseparable from the human body. Indeed, he is convinced that the doctrine of the separability of the soul is responsible in part for the threatened collapse of civilization. And then, again, he holds that there will be peace for the world of humanity only when the human mind is freed from materialism and is able to pass freely outside the bounds of our present universe to where time and space are not. Dr. Carrel the man of science shelters under the same hat as Dr. Carrel the mystic.

An Aphoristic Writer

Our author has the clear, emphatic style of French writers. His sentences are short, seldom extending beyond a line and a half, and often have the piquancy of aphorisms, as the following quotations will illustrate. "The sound body lives in silence." "Wealth is as dangerous as ignorance and poverty." "We are not able to fight successfully against misery or poverty." "Each one, in a certain measure, is born good, mediocre, or bad." "Body and soul are views taken of the same object." "They are saints—that is, those who are virtuous in a heroic manner." "Great scientists always have profound intellectual honesty." "Thought grows only within those who are capable of love and hate." "A great artist, a great scientist, a great philosopher is rarely a great man." "The lengthening of man's senescent period would be a great calamity." "It would not be wise to give everybody a long existence." "The ageing man should neither stop working nor retire." "The passion for conquest inspires all great adventures." "In

[1] *Man, The Unknown*. By Alexis Carrel. London: Hamish Hamilton. (12s. 6d.)

the poor as well as in the rich, leisure engenders degeneration." "There are as many different diseases as patients."

I have thought it well to discuss *Man, The Unknown*, at considerable length because of the high position occupied by its author in the realms of orthodox medicine. The ideas and doctrines which Dr. Carrel has enunciated in this book will evoke reverberations in medical and scientific circles for many a year to come. Those of us who believe that the art of healing can be advanced only by careful observation, clear-cut experiment, and sound reasoning will have Dr. Carrel cast in our teeth by charlatans, Christian Scientists, and faith healers, who believe there is a shorter road. Medical men ought to be familiar with *Man, The Unknown*. In reality, it reveals more concerning Dr. Alexis Carrel than about Man.

HEALTH EDUCATION

CONFERENCE IN LONDON

The eighth annual conference promoted by the Central Council for Health Education was held on November 21st, the morning session being devoted to health education in the schools, and the afternoon to physical education. There was a large attendance of representatives from local authorities, insurance committees, approved societies, and affiliated health organizations. Sir KINGSLEY WOOD, Minister of Health, who opened the second session, said that he hoped the Ministry would be able to extend the provision for playing fields and swimming baths. Further encouragement was to be given to nursery schools, in which good food, fresh air, and skilled training were available, also to plans for systematic physical training on school premises, and again to clubs and voluntary organizations in order that young people leaving school for office or workshop might keep up their physical exercises and continue to be instructed in healthy living.

Health Education in the Schools

Dr. A. S. MACNALTY, Chief Medical Officer of the Ministry of Health and the Board of Education, presiding over the morning session, said that much of the teaching of hygiene in the elementary school must be indirect and given as an integral part of school life. For children between 7 and 11 years of age formal lessons in hygiene were of minor importance compared with the formation of right habits through training in practices which were the foundation of a healthy life. Lurid films, scathing denunciations, and descriptions of the diseases and ill-effects which might follow neglect of the laws of hygiene defeated the ends of health education. The sensitive child was terrified or repelled, and the callous remained uninfluenced. For children over 11 instruction in elementary physiology and hygiene developing out of the lessons in biology was desirable.

Dr. J. J. PATERSON (M.O.H., Maidenhead) suggested that in the approach to health teaching a useful analogy was furnished by the teaching of handicraft. Just as the first lesson in handicraft consisted in naming, describing, and explaining the use of the tools, so should the child be taught the names, uses, and functions of the parts of the body. The next lesson was devoted to the care and maintenance of tools or implements, and the same sequence might be observed in a series of health lessons, with emphasis on personal cleanliness, tidiness, and exercise of the natural functions.

Among those who took part in the discussion were Dr. W. G. SAVAGE and Dr. E. H. T. NASH, both of whom suggested that considerable improvement might be made in the teaching of hygiene in the training colleges for teachers, and Dr. HENRY HERD, school medical officer for Manchester, who suggested that school medical officers could do something positive in this direction. When a school medical officer visited a school, which ought not to be at longer than quarterly intervals, he might devote some time to talking to the elder children on health. The school medical officer had an advantage over the teacher in this respect in his background of knowledge of the human body, and in the fact that even in the eyes of children he was recognized as an expert.

The Vogue of Medicines

Sir ARNOLD WILSON, M.P., a member of the Physical Education Committee of the British Medical Association, gave an address to the conference on "Health and Physical Education." He began by deploring the huge advertising of drugs, the advertisements being often accompanied by supposed recommendations from many anonymous members of the medical profession. The appeal of many of these advertisements was to fear. On reading them one would suppose the public to be in a state of appalling decrepitude, going about continually in terror of germs. The traffic in patent medicines and in medicines generally was of such dimensions that the cost exceeded that of the consumption of alcohol, if the tax were deducted on either side. And who could doubt that drugs did far more harm than alcohol? The patent medicine tax produced £337,000 just before the introduction of national health insurance. By 1924 it was producing nearly £1,500,000. It had since fallen to something like £750,000, and was still falling, but that was not because druggists and grocers were selling smaller quantities, but because measures of avoidance—he did not mean evasion—had been taken, and now by far the greater bulk of patent medicines was not subject to tax, but was sold by unqualified persons without let or hindrance. This problem must be seriously tackled. It was a form of maleducation which the council could not overlook. He was frankly surprised at the decision of the British Medical Association not to republish in a new form its classic book *Secret Remedies*.

Next he turned to the inadequacy of the national health insurance system as exemplified by the non-universality of adequate dental benefit. Far more education was necessary on the importance of the teeth. He was in constant touch with working men and women who were suffering in health far more from lack of dental care and treatment than from any other single thing. People in the middle classes often spent three times as much on dental treatment as on doctors, yet those in national health insurance were expected to be content with a sum allocated to dental treatment which was less than the amount allocated for drugs.

Again, there was the question of ophthalmic treatment. To what extent was that problem really being investigated? Was it desirable to give all children whose eyes were found to be defective a pair of glasses and leave it at that? That was what was going on on a large scale, and a vested interest was even growing up under it. Had the possibilities of eye exercises and eye training been properly investigated? He did not like to see a young country labourer wearing glasses to do his manual work for no better reason than that they had been prescribed for him in childhood for some defect which might have been dealt with in another way, and now he could not do without them.

Physical Education in the Schools

Sir Arnold Wilson expressed some healthy doubts with regard to school furniture. It could be made with a much better appreciation of scientific principles and more regard to the particular child. He understood that there were only three sizes of school desks officially approved by the Board of Education, though there were about forty sizes of boys officially approved by the Almighty! He wanted to see the child at school at least as well treated as the typist in the office with regard to adjustmen of seat and desk.

Lack of sleep was probably the principal disadvantage from which the children of the working classes now suffered. It was a form of malnutrition, with a profound effect in frayed nerves, lassitude, and lack of appetite. Physical fitness should be one of the subjects for which marks were given in school examinations, the marks to be awarded not to those whose physical endowments were

greatest, but to those who had done most to improve their own bodies and bodily habits and to overcome their own defects. The Board of Education should have its own peripatetic inspector of health whenever there was a school inspection. Over-athleticism was probably as great a danger for young men and women as under-exercise. This hobby-horse of exercise and drill must not be run too hard. In Germany last year he visited twelve universities, and in nine of them he was informed in an aside that the real trouble was that the physical exercises were being overdone.

In the ensuing discussion Dr. J. J. PATERSON (Maidenhead) said that Sir Arnold had criticized the British Medical Association for not reissuing its instructive booklet *Secret Remedies*, but regard had to be paid to the law of libel, under which heavy penalties might be exacted, even on account of statements which were not inaccurate. Mr. G. S. ELLISTON, M.P., said that the Medicines and Surgical Appliances (Advertisement) Bill, which had the support of the principal newspaper proprietors, if not in their corporate at least in their individual capacity, would be reintroduced in the new Parliament, and he hoped the Minister would regard it with new favour. The discussion was continued by Dr. DUNSTAN BREWER, Dr. DRUMMOND SHIELS, Dr. ARTHUR MASSEY, and Dr. F. W. W. GRIFFIN, the last-named remarking that some of them were at present studying in a committee the question of posture, and they believed that the faulty posture started early in life low down in the back, with tilting of the pelvis. If that was so it seemed of little use to direct exercises to the middle and upper part of the back. He also indicted the school desk as partly responsible for bad breathing habits in children, whereby the lower part of the chest was not brought into action.

Sir ARNOLD WILSON, in a brief reply, said that he would restrict not only advertisements of medicines, but also the colossal advertisement of alcohol, which he thought an anti-social tendency.

BRITISH ORTHOPAEDIC ASSOCIATION

ANNUAL MEETING IN MANCHESTER

The British Orthopaedic Association held its annual meeting in Manchester on October 25th and 26th under the presidency of Mr. HARRY PLATT.

Economic Results of Fractured Os Calcis

The first morning was devoted to the subject of fractures of the os calcis. A discussion on their economic results was opened by Messrs. B. L. MCFARLAND and W. J. EASTWOOD of Liverpool, followed by Messrs. J. P. HOSFORD, R. J. FURLONG, and T. T. STAMM of London. All the speakers were agreed that the final result depended on whether the subastragaloid joint was disorganized or not. If it was not involved an excellent functional result ensued in the majority of patients. Where the joint surfaces were disturbed permanent disability was likely for two reasons: (*a*) the development of a painful arthritis; and (*b*) the weakness of the calf muscles consequent upon upward displacement of the posterior fragment of the os calcis.

In the experience of the openers the type of treatment employed did not appear materially to influence the ultimate function of the foot. Restoration as far as possible of the normal anatomy of the os calcis by the powerful skeletal traction method advocated by Böhler of Vienna had not, in the few cases so treated, restored the patient to heavy labour any more successfully than simple manual moulding and fixation in plaster-of-Paris for several months. Nor had it shortened the time in which the individual could return to lighter occupations. The importance of other factors apart from the methods of treatment was emphasized. These included the mental and physical type of the injured person, his occupation, and the disturbing influence on his outlook of the problems of compensation.

Results of Attempted Reduction in Fractures of the Os Calcis

By invitation of the association, Dr. E. E. MYERS (Boston, U.S.A.) reviewed a consecutive series of thirty-three fractures involving the subastragaloid joint treated in the fracture services of the Ancoats Hospital and the Manchester Royal Infirmary. These were divided into two groups: (1) Eighteen fractures in which an attempt has been made, with varying success, to restore the normal anatomy of the os calcis by powerful skeletal traction and compression. More than half of this group of patients were able to return to their original arduous duties without subjective symptoms and with no appreciable impairment of the function of the foot. (2) Fifteen fractures treated only by manual manipulation and fixation in plaster-of-Paris. Of this group only one-third of the patients were able to return to heavy work.

Dr. Myers emphasized that the results were invariably better in the light, wiry type of individual, and that in those patients in whom the best results were achieved the subastragaloid joint was clinically ankylosed. He concluded that a very definite advance in the treatment of these fractures had been made by attempts to restore the normal anatomy of the foot, and suggested that in certain cases, following a reduction, early arthrodesis of the subastragaloid joint might be expected to increase further the numbers of good functional results.

Mr. R. OLLERENSHAW (Manchester) said that if a two-year period was allowed to elapse before a final analysis of these fractures was made the general results were not so disheartening. Reviewing a series of forty-five patients in all of whom the fractures were more than three years old, he had found that thirty-four had returned to their original work. For those who continued to complain of pain his routine was to manipulate the foot into inversion and apply a plaster-of-Paris cast for several weeks. A very small number of old fractures required a subastragaloid arthrodesis, but this procedure could not always be relied upon to produce complete relief of symptoms. Mr. A. H. TODD (London) recommended arthrodesis of the subastragaloid joint, and the mid-tarsal joint also if this was disorganized, after ordinary palliative methods had failed.

In the afternoon a clinical and pathological demonstration was given by local members of the association in the out-patient department of the Manchester Royal Infirmary.

On the second morning several short papers were read. Mr. R. OLLERENSHAW (Manchester) discussed the use of the substandard cinematograph films in case recording. He pointed out the many advantages of such films for demonstration and teaching purposes. Using a "cassette" camera, continuous records of a patient in all stages of his treatment, occupying only some fifty feet of film, could be made at any appropriate time. Three films were shown, one of them portraying in colour the operative treatment of pes cavus, and providing very convincing evidence of the potentialities of the cinematograph in surgery.

Mechanism of Bone Absorption

The histological aspect of this subject was discussed by Professor S. L. BAKER (Manchester) and the radiological aspects by Dr. E. W. TWINING (Manchester). Professor Baker, as a representative of the Schmorl-Turnbull school of bone pathology, maintained that bone resorption was an active cellular process in which bone was removed piecemeal by osteoclasts. In rickets and osteomalacia there was no evidence of removal of calcium salts from the bones. The pathological process was essentially a failure to calcify new bone formed during the course of these diseases—in other words, a *hypocalcification* and not a *decalcification*. He criticized the "osteolysis" theory of Leriche and Policard, who regard bone absorption as a "breaking down" of the bone into connective tissue without the aid of living cells, a process which these authors claim is seen particularly in Paget's disease and generalized osteitis fibrosa. Leriche and

Policard admit that this process is often indistinguishable from bone formation, and Professor Baker suggested that they had mistaken areas of coarse-fibred bone formation, which are common in Paget's disease and osteitis fibrosa, for areas of bone formation. Thus there were two processes which could lead to diminished density of bone in radiographs:

1. Hypocalcification, which occurred in (*a*) rickets and the osteomalacia group of diseases; and (*b*) rapidly forming coarse-fibred bone (no time for calcification, or calcification delayed)—for example, fracture callus.

2. Osteoclastic resorption, which accounted for all other examples of diminished bone density.

Dr. Twining agreed that, so far as could be told from the *x*-ray appearances, diminished bone density was due to actual loss of bony structure rather than to a mere removal of calcium.

Congenital Torticollis

Mr. C. H. GRAY (Manchester) presented an analysis of one hundred children between the ages of 1 and 14 years treated for congenital torticollis. Of these hundred patients there had been difficulty in delivery in slightly over half of them. A sterno-mastoid "tumour" was noted in twenty-three babies only. In fifty both heads of the sterno-mastoid muscle were contracted. Discussing the results of treatment, Mr. Gray emphasized the importance of ocular anomalies. He pointed out that the eye on the affected side develops a point of false correspondence. After correction of the torticollis deformity this point no longer lies on the optical axis. To overcome this visual disturbance the child voluntarily replaces its head in the position of deformity. Mr. Gray's contribution provoked considerable discussion as to the relative merits of the "open" versus the "closed" tenotomy of the contracted sterno-mastoid muscle. All speakers were agreed that prolonged and careful after-treatment was necessary to ensure complete and permanent correction of the deformity.

Dr. M. F. JOHNSTONE (Manchester) reported thirty examples of osteochondritis occurring during the period of treatment following the manipulative reduction of congenital dislocation of the hip-joint in 224 children. The changes affected the femoral head and the acetabulum, and were exactly similar in *x*-ray appearances and in the final result to those seen in pseudocoxalgia. The onset of osteochondritis did not appear to be determined by difficulties encountered in reduction.

Mr. H. OSMOND CLARKE (Manchester) reviewed a series of twenty-six patients suffering from fractures of the internal epicondyle of the humerus with inclusion of the epicondyle in the elbow-joint. He pointed out that during the reduction of a complete postero-lateral dislocation of the elbow-joint the epicondyle may occasionally slip into the elbow-joint, but that this could be avoided by reasonable manipulative skill. More commonly the epicondyle is torn off by a forcible abduction of the forearm on the arm which tears open the joint capsule on the mesial aspect. The epicondyle immediately enters the joint and maintains a state of lateral subluxation of the joint, which, in the absence of great swelling, can be appreciated by clinical examination. Ulnar nerve involvement of varying severity was the rule in this latter type of injury. The treatment advocated was open operation, for it allowed replacement of the epicondyle and transposition of the ulnar nerve to a safe intramuscular bed in front of the epicondyle.

The tercentenary of Dr. John Hall, son-in-law of William Shakespeare, occurs this year. To celebrate it the trustees and guardians of Shakespeare's birthplace have arranged an exhibition, in the New Place Museum, of original records, books, and other objects illustrating Dr. Hall's life at Stratford-upon-Avon. This was opened on November 25th by Sir Archibald Flower; and Mr. Frederick Wellstood, secretary and librarian to the trust, gave a short address on the exhibits.

SOCIETY OF MEDICAL OFFICERS OF HEALTH

SIR KINGSLEY WOOD AT ANNUAL DINNER

The annual dinner of the Society of Medical Officers of Health, which was attended by nearly three hundred members and guests, was held at the Piccadilly Hotel on November 22nd, with Dr. W. G. SAVAGE, president of the society, in the chair. The principal guests were:

Sir Kingsley Wood, M.P. (Minister of Health), Sir George Newman, Lord Sneil (Chairman of the London County Council), Lord Bayford (President of the County Councils Association), Sir George Chrystal (Secretary of the Ministry of Health), Dr. A. S. MacNalty (Chief Medical Officer of the Ministry and of the Board of Education), Sir Ewen Maclean, Dr. Robert Hutchison (President, Royal Society of Medicine), Sir F. Kay Menzies (Medical Officer of Health, L.C.C.), Mr. J. W. Catlow (President, Association of Education Committees), Dame Louise McIlroy, Sir William Willcox (Master of the Society of Apothecaries), Dr. J. S. Fairbairn (Chairman, Central Midwives Board), and Dr. G. C. Anderson and Dr. Charles Hill, representing the British Medical Association. There were also several representatives from Somerset, in which county the president is medical officer of health.

The Minister of Health

Sir KINGSLEY WOOD, in proposing the health of the society, said that he began his association with the Ministry as Parliamentary private secretary to a distinguished medical man, Dr. Addison; he held the same position under the late Sir Alfred Mond, a man of much more frugal mind, and he sat in opposition to another Minister who did good service, Mr. Arthur Greenwood. When he last addressed the society, ten years ago, he was Parliamentary Secretary to the Ministry, under Mr. Neville Chamberlain. They had been ten eventful years in public health legislation and in medical advance. The Local Government Act, 1929, under which 143 Poor Law institutions had been appropriated for public health service, had brought about great changes. The maternity and child welfare service had also seen a great advance. During those ten years the number of ante-natal clinics had increased from 350 to nearly 1,500, and the number of child welfare centres from 2,300 to well over 3,000. The tuberculosis service had been extended, the number of beds in institutions increasing from 21,400 in 1924 to 28,900 last year. This progress had been achieved despite the financial difficulties of 1931, and great credit was due to the local authorities and, particularly, their medical officers. But there was a great deal still to do. He knew that he would have the co-operation of medical officers of health in seeking a solution of the problem of maternal mortality—a problem which, though not numerically large, touched the hearts and consciences of a great many people in this country. There was also the statistically greater problem of cancer, from which 60,000 people died every year, and from which at any moment perhaps 150,000 were suffering. But it would be a mistake to suppose that they were entirely defenceless in the face of this enemy, and there was indeed some danger of allowing cancer to become a bogy. A change in the popular attitude on this matter would not be a bad thing. Cancer research was proceeding steadily, and already in radium and deep *x*-ray treatment as well as in operative treatment there were means of curing or alleviating a larger number of cases than was supposed, and it was not true that a diagnosis of cancer was necessarily a death sentence. He had a full programme for the next few years, and he knew that he could rely upon the co-operation of those whom he was addressing.

Dr. SAVAGE, in response, said that the society always tried to have a stimulating effect upon Ministers of Health, but he was not sure in Sir Kingsley Wood's case whether such stimulus would be required. The society was now seventy-nine years old, and its membership comprised the majority of those who practised in the public health service. Dr. Savage entered upon a comprehensive description of the duties and qualifications of the medical officer of health. In addition to his ordinary medical and public health qualifications, he must be a sound physio-

logist, a trained statistician, must have a good working knowledge of bacteriology, chemistry, meteorology, and geology, must know a good deal about planning and architecture, have a fair knowledge of animal pathology, be a student of entomology, be somewhat of an authority on mental deficiency, be acquainted with industrial diseases, and, finally, have in him the makings of a good popular lecturer.

A Tribute to Sir George Newman

Dr. GEORGE F. BUCHAN, on behalf of the society, expressed to Sir George Newman on his retirement their high appreciation of his work and their great regard for him as a colleague and friend. What medical officers of health liked to remember was that before Sir George Newman went to Whitehall he was himself a medical officer in a metropolitan borough and a rural county. But he was marked out for preferment by his high scientific attainments and his gift of erudite expression. For twenty-eight years he had held high office. He had laid the foundation of the school medical service, and later had united at the Ministry of Health the medical activities of the various departments of the Government. His annual reports were of outstanding value. He was perhaps the greatest medical writer of his time. Few men had been both good doctors and good writers. But above all was the zeal with which he had pursued the preventive aspects of medicine. He went into retirement with all their affection and gratitude.

Sir GEORGE NEWMAN described himself as coming back after a long exile to a society which he had joined forty years ago. In 1895 he was instructed by wise men to join the Epidemiological Society, which had Sir Shirley Murphy for its president, and the Society of Medical Officers of Health, where he first met Arthur Newsholme, J. C. McVail, and many others whom he mentioned. In the spring of 1907 he was invited to a small dinner party of persons interested in the future of public health, and out of that arose an invitation, sent him from the Crown, to go to Whitehall. There was some controversy as to his suitability, and it was a particular satisfaction to him that alone in the medical profession at that time the Society of Medical Officers of Health believed that he could undertake the task allotted to him. In a funeral oration which Pericles delivered to the Athenians, speaking of the rank and file of the soldiers in the Peloponnesian War, he said that they had one comfort which would be shared by all their kin thereafter, that they had a home in the hearts of men. He supposed it was true that practically the only reward that came to the worker in public health was this extraordinary gift, which cost nothing but was the best of all rewards, the satisfaction of their professional colleagues. He was first taught the duties of a civil servant by Sir Robert Morant, a man whose contribution to the public health service it was difficult to overestimate. Morant told him that although the medical officer of health of a district might do all sorts of things, when he entered His Majesty's Service he had to remember that his function must be fulfilled in silence and that his path was a hidden one ; also that the reward of work was not higher wages, but more work ; and, finally, that the civil servant must remember that at the beginning and the end there was no such thing accredited to him as single-handed achievement. Sir George Newman said that he had experienced no difficulty in accepting this counsel ; he had found it very true. In the course of twenty-eight years he had served nineteen different Ministers—eleven at the Board of Education and eight at the Ministry of Health—and the staff, which began with two, now approximated to 150 medical men. During his forty years' acquaintance with the society it had seen a constantly enlarging sphere of public health service, and a great increase in numbers and improvement in status of the men engaged. Forty years ago John Simon said that there was too little direct power in administration for the medical officer and his sphere of work was too narrow. Nowadays, if anything, there was too much administrative work for them all, and the sphere had become so large that some of the foundations of preventive medicine were liable to be neglected.

INTEGRATION OF THE ENDOCRINE SYSTEM

VICTOR HORSLEY LECTURE BY SIR WALTER LANGDON-BROWN

The Victor Horsley Lecture was delivered on November 19th at University College Hospital Medical School by Sir WALTER LANGDON-BROWN, whose subject was " The Integration of the Endocrine System." Sir F. GOWLAND HOPKINS, who occupied the chair, said that he had many grateful memories of Victor Horsley. As far back as the late 'eighties or the early 'nineties, when Victor Horsley was still a young man, he spared no pains to encourage a still younger man (himself). He combined with his professional skill an abiding interest in science for its own sake, and in those days, though the speaker had embarked on studies very far from Horsley's immediate interest, he never met him without receiving encouragement from his kindly words and radiant personality.

The lecturer began by recalling the excitement which he well remembered going through the physiological department at Cambridge when, on January 30th, 1892, Victor Horsley gave a paper entitled " Remarks on the Function of the Thyroid Gland : A Critical and Historical Review," and how eagerly they all awaited the second part of the paper, which appeared a week later. Papers like that did not come out of " the blue " ; Horsley himself had been working on the subject from 1884. Sir Walter Langdon-Brown reminded his audience briefly of the steps which had led up to that paper, beginning with Gull's description of the cretinoid state. But Claude Bernard's conception of internal secretion was slow to permeate physiology and medicine. In 1894 Horsley was awarded the medal of the Royal Society for his investigations relating to the physiology of the nervous system and of the thyroid gland. Those were, of course, two separate lines of inquiry, but the purpose of the present lecture was to show how much more closely they were related than was imagined at the time. The subject seemed particularly appropriate at University College, which had played so large a part in elucidating these problems, mainly owing to the work and inspiration of Sir E. Sharpey-Schafer, whose recent passing had left a notable gap in their ranks.

The Expression of Emotions

Sir Walter proceeded to indicate three recent lines of research which were leading to a clearer conception of the endocrine system : (1) the diencephalon had been conclusively shown to be the nervous structure concerned with the expression of emotion ; (2) the pituitary, so closely associated with the diencephalon, had been recognized as the " leader of the endocrine orchestra " ; (3) it was now realized that all nervous impulses had a chemical mediator between the neuron and the tissue cell, and indeed between one neuron and another.

As a proof that the diencephalon was the structure concerned with the expression of the emotions, the lecturer described a case in which a tumour involving the whole of the hypothalamus had completely blotted out emotional expression. It was the case of a girl, aged 10, who came under observation with a history of unusual temperament from birth, never showing any demonstrativeness or emotional reaction, never shedding a tear, and remaining indifferent even at the prospect of death, although her mental powers were good and her memory excellent. At post-mortem examination a large tumour, smooth and lobulated, was found projecting from the base of the brain in the hypothalamic region,

microscopically a teratoma. There were other unusual symptoms, but the striking feature of the case was the blocking out of emotional expression.

The next point was the close association between the nervous diencephalon and the glandular pituitary. The anatomists of the past, looking at the brain enclosed in bone and joined by a narrow stalk to the small pituitary body also enclosed, were struck with the idea of a little shrunken brain which responded to or repeated the actions of the big brain. Modern research had shown that there was more in this idea than at first appeared, as was proved by Harvey Cushing in the brilliant review given in his Lister Memorial Lecture, wherein he showed how the symptoms arising from the disturbance of this ancestral apparatus were beginning to stand out in their true significance. Diabetes insipidus had been referred by some observers to a hypothalamic lesion and by others to a pituitary one ; damage to either region or to the stalk could have that effect.

The Leading Function of the Pituitary

Having thus established the connexion between the activities of the diencephalon and the pituitary, it remained to be shown that the pituitary was the leader of what he had called the "endocrine orchestra." In order to gain any clear impression of the present position it was necessary to be concise and rather dogmatic. Three types of cell were recognized in the anterior pituitary: the chromophobe cell, which resisted staining ; the eosinophil ; and the basophil. That the eosinophil cells were the source of a growth hormone could be definitely accepted. The basophil cells had been regarded as the source of the sex hormone. The view might be accepted that the growth and the sex hormones were antagonistic, and it was not until the latter gained the upper hand that puberty was established. But there were strong reasons for doubting that the basophil cells were the source of the sex hormone. It must always be remembered that the gonadotrophic extracts used in therapeutics were obtained not from the pituitary but from the placenta or the pregnancy urine. The prime importance of the anterior pituitary in initiating the events of the reproductive cycle must be admitted, but the process suggested that it did so by calling into activity hormones that were formed in the gonadal apparatus itself. This seemed all the more probable in view of its capacity to evoke response in male and female alike.

What was the function of the basophil cells? There had been rather too much readiness to conclude that the syndrome of pituitary basophilism confirmed the idea that the sex hormone originated in these cells. If this were so it was unreasonable to suppose that in women virilism and decay of sexual function should follow excess of it. In earlier days the number of centres located by physiologists in the medulla multiplied until a revolt was produced. In the same way the functions controlled by the anterior pituitary had multiplied until the existence of a separate hormone for each function had become almost incredible. As someone had said, to suppose that this small gland, which in man averaged half a gram in weight, secreted this number of hormones as separate entities throughout the entire secretory process unduly taxed the imagination.

In view of all the facts the conception of the anterior pituitary producing an accelerating hormone in the eosinophil cells and an inhibitory one in the basophil cells seemed rational, the functions and staining reactions of these cells being diametrically opposed. Fresh light on the whole subject had been thrown by Dodds, who classified hormones into complex bodies formed in the anterior pituitary acting on other endocrine glands and causing them to produce a secondary type of hormones, bodies of small molecular weight, most of which had been isolated in the crystalline form and some formed synthetically. It was accordingly by no means fanciful to regard the anterior pituitary as receiving the impulses from the diencephalon and producing an activating and an inhibitory hormone according to demand which could speed up or inhibit the secretion of the smaller grade of hormone in the other endocrine glands. It was at any rate a unifying hypothesis which deserved careful consideration. The question had not been simplified by the claims made for the existence of anti-hormones. It had long been common knowledge that emotional states might modify secretion. The tears of sorrow and the dry mouth of fear were proverbial. In such instances it was obvious that a nervous impulse had produced or prevented a chemical process. But it was only quite recently that it had been realized that all nervous impulses had a chemical mediator between the neuron and the tissue cell, and indeed between one neuron and another. The chemical changes produced in the gland on nervous stimulation were only a special case of a general law.

Receptor Substances

This led the lecturer to an aspect of endocrinology urgently demanding attention. Some thirty years ago Langley and Elliott postulated the existence of a receptive substance between the nerve endings and the tissue as necessary to explain the facts then known. If such a postulate was required then, how much more was it needed to-day. The pharmacology of the future would have to concern itself with the natural history of these receptive substances, and find out how they could be helped by drugs—negatively by blocking the way to the entrance of toxins, and positively by assisting their function. In his recent Harveian Oration Sir Henry Dale had reminded them that they were still entirely without any conception why particular cells should be sensitive to a particular chemical substance, or why the substance should stimulate the activity of one kind of cell and inhibit that of an other. The nature of the stimulus had been intensively studied, but it was now clear that this was only the half, and perhaps the smaller half, of the question. The importance of the responsive capacity of the receptor tissue was clearly indicated by Harrison in his Harvey Lectures of 1934. After the menopause oestrin might be present in large amounts, yet the reproductive cycle ceased, as if the reproductive organs had lost their capacity rather than that the stimulus was lacking. They had as yet no inkling as to the mechanisms by which such cellular response was produced or rendered specific. The present position of endocrinology involved a consideration of the whole structure of the cell.

There were a good many examples of a double mechanism in physiology, and this might be expected to occur in endocrinology. The nervous control over the pancreatic secretion, both external and internal, had become recognized. If the recent claims were substantiated that an oral administration of duodenal extract could keep the sugar of a diabetic normal after previous treatment with insulin, a therapeutic advance of importance would also have been made. Recent embryological work had shown the profound influence exerted by chemical agents on the very genesis of the nervous system. Thus from the start chemical and nervous mechanisms were interdependent. It seemed probable that the formation of teratomata was to be explained by the escape of chemical organizers from their proper site.

Sex Reversal

It might be well to say something on sex reversal. Undoubtedly the initial bias in sex differentiation was determined by the chromosomes, but the effect was much slighter in birds and animals than in insects, and had to be reinforced by endocrine activity. The testis was monosexual, while the ovary was bisexual. Therefore physical sex reversal could only occur in women, and might be due to the overaction of three different types of structures, which the lecturer described. Sex reversal in men could only be psychogenic.

To repeat his argument, the anterior pituitary formed two basic secretions—one stimulating, the other inhibiting in effect. It was suggested that these basic secretions were capable of chemical modification according to the needs of the body, and were then ready to stimulate or restrain the secretion of smaller hormones by the other endocrine glands, including the post-pituitary. It could be said that the whole process appeared to be a special case of a general law that nervous stimuli, whether passing from the diencephalon to the pituitary or down the neurons to the pre- and post-ganglion endings, acted through the intermediary chemical substances locally produced.

The lecturer concluded with another tribute to Horsley, himself an enthusiastic "intellectual hormone" in his effect upon others. Osler had said that in October, 1873, he listened to an introductory address in one of the largest medical schools of Great Britain, in which it was said that the art of surgery had all but reached its limits. In the falsification of that gloomy prognosis Horsley with his training in pathology, his new ideas, and his fresh technique must be allowed an honourable share.

Sir F. GOWLAND HOPKINS, in thanking the lecturer, remarked that nearly fifty years ago Horsley said to him at a meeting of the Physiological Society, "You physiological chemists"—the word "biochemist" was not then invented—"are going to have a jolly good time," and he thought that in the years that had passed since then they had had it. He only wished Victor Horsley could have heard the lecture. The picture which occurred to him was of the body as a sort of Fascist State, with the Duce very carefully protected.

BRITISH EMPIRE CANCER CAMPAIGN

ANNUAL GENERAL MEETING

At the annual general meeting of the British Empire Cancer Campaign at the House of Lords on November 25th, the Duke of York, who presided, said that the report which was presented, under the editorship of Mr. Lockhart-Mummery, enabled everyone to appreciate the great amount of activity that was taking place on behalf of the Campaign throughout the Empire. As a result of the last two Empire Day appeals the Campaign had been able to give all possible financial support to the well-devised schemes of research which were progressing far and wide. In the lists of donations for this year were included contributions from thirty-five centres over-seas. As far as the British Dominions were concerned, their donations were always sent to their own research centres. He was exceedingly glad to see that the Campaign had secured the help of all the teaching hospitals of London in the formation of a clinical cancer research committee, and he was most hopeful that it would yield results of great importance. The Campaign rightly set a high value on educational propaganda, and had established a strong central propaganda committee. Finally, he referred to the activities of the scientific advisory committee, and thanked the representatives nominated by the Royal Society, the Medical Research Council, and the Campaign itself for devoting so much time and effort to this work, and congratulated the chairman (Lord Horder) and the members on the work they were doing.

Lord DAWSON OF PENN moved a vote of thanks to his Royal Highness, saying that his interest in the Campaign was no mere formality. The problem of cancer still remained enveloped in darkness, but it might fairly be said that the darkness was less dense, and the penetration of that darkness was due to the gifted workers who, encouraged by the Campaign, were pursuing many lines of inquiry in this country and overseas. If the work was persisted in there was no doubt that some day or other the problem of the cause of cancer would be solved.

On the proposition of Mr. STANFORD CADE, seconded by Mr. P. J. NEATE, the members of the Grand Council were re-elected, with the exception of Sir Holburt Waring, who, having removed from London, did not desire to continue.

Mr. W. SAMPSON HANDLEY submitted the report and the balance sheet. He mentioned that the amount expended on cancer research was equal to one farthing for each inhabitant of Great Britain, Mr. Julian Huxley had recently done good service in drawing attention to the disproportion between the relatively small amount expended on research affecting health and the large amount spent on research for industrial or military purposes. The present report was the twelfth instalment of a serial history the length of which no one could foresee, but which they all hoped and believed would have a happy ending. At any rate, the chapter just written was full of those elements of uncertainty but of new and hopeful prospect which made readers look forward to next year's instalment. He directed special attention to the remarks in the report on carcinogenic agents, also to the new method of investigating the nature of the filterable agents of chicken sarcoma. The importance of dental hygiene needed to be emphasized afresh in connexion with the propaganda on public health education which the Campaign was undertaking. "The slums of the body must be abolished as well as those of the city."

Mr. BEAUMONT PEASE, in seconding the adoption of the report, referred to the improved financial position, and said that all the cuts in the grants to institutions had been restored, and in many cases increased.

The report having been adopted and the auditors reappointed, a meeting of the Grand Council immediately took place, at which Lord Reading was re-elected chairman, and Lord Dawson of Penn re-elected and Sir Cuthbert Wallace elected vice-chairmen. Grants totalling over £25,000 were approved by the Grand Council. These included £8,000 to Middlesex Hospital, £5,000 to the Cancer Hospital, £3,500 to St. Bartholomew's, £1,850 to Mount Vernon, £1,800 to Westminster, £900 to St. Mark's, £600 to the Marie Curie, and £400 to the Strangeways Research Laboratory.

The Food Group of the Society of Chemical Industry will hold a joint meeting with the Manchester section and local members of the Chemical Society at Manchester on Friday, December 6th, when there will be a symposium on "Micro-organisms and Foodstuffs." At 2.30 p.m., at the College of Technology, papers will be read by Dr. P. W. Clutterbuck, on "Recent Developments in the Biochemistry of Moulds," and by Dr. T. K. Walker on "Recent Developments in the Biochemistry of Bacteria." At 6 p.m., at the Engineers' Club, 17, Albert Square, there will be an informal dinner, followed by papers by Dr. R. G. Tomkins on "Microbiology of Fruit," by Miss A. A. Nichols on "The Bacteriology of Canned Milk Products," and by Mr. C. H. F. Fuller on "Micro-organisms in the Baking Industry."

Scotland

Edinburgh Public Medical Service

The public medical service which was instituted last year in Edinburgh to provide medical attendance and medicines for persons of limited means upon the basis of a weekly subscription held its first annual meeting in the British Medical Association House, Edinburgh, on November 21st. Dr. John Young, who occupied the chair, said that the committee had been quite satisfied with the result of the year's working, while there could be no doubt that the service was filling what had been a distinct want in the city. The number of doctors now taking part in the scheme was 130, and during the year 3,500 subscribers, representing over 8,000 persons, joined the service. The sums received as subscriptions amounted to £3,232, and out of this sum the committee had to meet the cost of prescribing and the expense of administration. Some difficulty had been experienced in regard to the cost of medicines. Under the national health insurance scheme the average cost of drugs was 1s. 10d. per person, and this worked out at about 14 per cent. of the subscriptions received in the case of this service. During last spring there had been an influenzal epidemic in Edinburgh, and for a time the cost of prescriptions for the public medical service had increased to 25 per cent. of the subscriptions, but after April the cost began to fall, and reached 12.2 per cent. in August. For the whole year the average cost had been 18.2 per cent. instead of the estimated 14 per cent. In all, 11,251 prescriptions had been issued at a cost of £593, which was an average of 12.06d. per patient. It was expected that next year the expenditure on medicines would be brought down to 16 per cent., and that the administrative expenses would also be less than they had necessarily been in the first year of working. The committee had also been considering methods by which subscribers to the service could obtain specialist treatment at reduced rates. Arrangements had accordingly been made with the radiologists in the city and with the National Ophthalmic Treatment Board for special terms, and also for certain laboratory diagnostic work at reduced fees. It was stated that the doctors who had large lists had been quite satisfied with the remuneration they had received during the first year, and that in comparing the service with the national health insurance scheme it had to be kept in mind that the doctors did not have to complete the patients' certificates and make the returns required by the latter service, and that there was no interference by any insurance committee. The report was approved, and the office-bearers were re-elected for the ensuing year.

Health of Scotland

The return of births, deaths, and marriages registered in Scotland during the quarter ended September 30th, 1935, shows that the number of births was 21,564, or 17.3 per 1,000 of the population, which, however, was 1.5 below that for the preceding quarter. The rate for the large burghs was 17.7, ranging from 23.5 in Airdrie and 22.3 in Port Glasgow to 13.3 in Arbroath and 11.9 in Rutherglen; in the counties it ranged from 20.9 in Wigtown to 11.4 in Shetland and 10.9 in Selkirk. Deaths during the quarter numbered 13,461, giving a rate of 10.8 per 1,000 of population. These were 2,739 fewer than in the previous quarter. The death rate for the large burghs was 10.7, compared with 10.9 for the rest of Scotland, and the rate in individual large burghs ranged from 14.3 in Inverness and 13.1 in Arbroath to 9.3 in Clydebank and 9.1 in Airdrie; in the counties it ranged from 15.1 in Kinross and 14.5 in Argyll to 9.0 in Stirling and 8.8 in Lanark. The infant mortality was 1,180, giving a rate of 55 per 1,000 registered live births; this was the lowest infant mortality rate so far recorded for Scotland. As to the causes of death, the principal epidemic diseases accounted for 2.7 per cent. of all deaths, the highest figures being for diphtheria and whooping-cough. Deaths from all forms of tuberculosis numbered 756, or 5.6 per cent. of the total deaths; the quarterly death rate was 61 per 100,000, as compared with the previous average of 71 for this quarter. The number of deaths from malignant disease was 1,949, or 14.5 per cent. of the total deaths, with a rate of 5 above the average.

Edinburgh Dental Hospital

A new dental clinic for public service was inaugurated at the Edinburgh Dental Hospital on November 18th. Hitherto the hospital has been open for treatment of the public in the morning only, but to meet the increasing demand there will in future be two evening sessions, on Tuesdays and Thursdays. This has been made possible by the equipment of a new conservation room at a cost of about £3,000. The new department, which occupies the top floor of the hospital, has been provided with twenty-four dental units furnished with modern chairs, electric engines, etc. It forms part of the scheme to re-equip the hospital and bring it into line with modern requirements which is being pushed forward energetically by Mr. Hutchinson, the dean. The hospital serves a wide area of Scotland, including not only the city of Edinburgh, but Fife, the Lothians, and neighbouring counties.

England and Wales

London Voluntary Hospitals

A statistical review of the work and finance during 1934 of 145 London voluntary hospitals has just been issued by King Edward's Hospital Fund for London, and a comparison is made with the four previous years, revealing the effect of the financial crisis of 1931 and of the subsequent years of depression. Two outstanding points are the steady increase of the work done by the hospitals and the continuous and highly meritorious public support. The bed accommodation increased by 310 during the year, making a total increase of 920 since 1930. No fewer than 2,139,000 sick and injured persons were treated, of whom 269,000 were in-patients. These are record totals for both in-patients and out-patients; the increase in the former since 1930 was 20,400, and in the latter 53,000, the major part of both increases occurring in the year under review. This was the first appreciable rise in the number of out-patients, the totals for the four previous years having fluctuated within the narrow range of about 1 per cent. The attendances, on the other hand, show an annual increase. The explanation suggested for this apparent anomaly is that attendance is now discouraged for trivial complaints which can be adequately treated by other agencies than hospitals, and that the consultative side of the out-patient department is being developed, together with its facilities for providing more prolonged treatments of a nature that are not available elsewhere. The total income of the 145 hospitals was £3,980,000 in 1934, compared with £4,006,000 in the previous year, a decrease of £26,000, due to a fall of £124,000 in legacies, which was, however, very largely offset by an increase of £101,000 in ordinary income. Subscriptions and donations totalled £11,000 more than in 1933, but there was a fall of £12,000 in the receipts from central funds. There was an increase of £90,000 in respect of receipts for services, including the grant of the Hospital Saturday Fund, and of £12,000 in interest. The net increase raised the figure for total ordinary income to the highest point yet reached—namely, £3,594,000. Decreases in subscriptions and donations since 1930 have been more than offset by increases in receipts for services and in income from investments. Capital receipts for endowment, building, and equipment for the five years reflect the depression of the first years and the beginning of recovery in 1934. Voluntary donations for these purposes amounted to £1,107,000 in 1930; in 1931 they fell to £661,000, in 1932 to £477,000, and in 1933 to £409,000. In 1934 they rose to £915,000. During the last year, with a return of a measure of

prosperity to the country, there was renewed activity in hospital extension and building ; schemes deferred since 1931 were launched, new steps were taken towards the improvement of equipment, and the public answered appeals with donations of £774,000, in addition to £141,000 for endowment. Between 1930 and 1933 the rise in expenditure was small, but in 1934 there was a considerable increase. The balance of income over expenditure in 1934 was £93,000. This does not imply that all hospitals were free from anxiety ; some were still in serious difficulties in the year under review. While these deficits constitute a serious problem for the hospitals concerned, they are not typical of the general tendency of hospital finances down to the end of 1934, but are due to more or less exceptional circumstances. For the majority of these hospitals the difficulty did not lie in a failure to meet maintenance out of current income, but in the need of further funds to carry out necessary improvements in building and equipment. The increase in expenditure of the 145 hospitals in 1934 was relatively greater than the increase in the occupied beds and in the out-patient attendances. The resultant effect on the average statistical and total costs for all the hospitals was a small increase in both in-patient and out-patient costs. It must be remembered, however, that the figures reflect also the expense of additional benefits given by the hospitals to their patients as a result of the advances continually being made in medical and surgical practice. As regards capital expenditure, it has also to be borne in mind that in many cases structural renovation, or even reconstruction, is necessitated by the dilapidation due to the lapse of time. Moreover, there has been a widespread improvement in the accommodation for nurses. The figures for 1934 go far to dispel the doubts which are sometimes expressed regarding the present financial stability of the voluntary hospital system. The work of the hospitals is growing in scale as well as in quality as a result of the progress in curative medicine and surgery, but the receipts keep pace with the increased expenditure. More effective treatment is being provided free for the sick poor, as well as for the rest of the community, thanks to the generosity of private benefactors, the members of contributory schemes, and others who are admitted to pay-beds.

Royal Dental Hospital Dinner

The annual dinner of the staff and past and present students of the Royal Dental Hospital of London took place at the Trocadero on November 23rd. Mr. Herbert Smale, who presided, said that the number of dentists on the *Register* was just upon 14,500, of whom rather more than half were qualified men and rather less than half "Dentists, 1921." It seemed to him that with a population of fifty millions in the British Isles the number of dental practitioners was inadequate to deal efficiently with the teeth of the nation. His personal experience as a dental surgeon in one of the large London hospitals was that many teeth were extracted which could have been saved if there had been more dentists to do conservative work. Dentistry was now taking a more prominent place in the general field of medicine, and he hoped that as many students as possible would take a medical qualification as well as a dental one, as they would find it so much more convincing to discuss a case with a general practitioner on an equal footing. The dean of the school (Mr. H. Stobie), who mentioned that this was the fifteenth annual dinner at which he had spoken in that capacity, said that at the moment there were 131 students in the school. An increasing number were working for the London University degree ; perhaps this was due to an alteration in the curriculum, which now made it possible for a man to prepare for his L.D.S. diploma and his B.D.S. degree *pari passu*. A feature of the school work during the year had been a series of post-graduate lectures and demonstrations in such subjects as radiology, prosthetics, local anaesthetics, and dental surgery. He referred to the great honour bestowed on a member of the school staff, Dr. E. W. Fish, when, on being invited to Australia to give a series of lectures and demonstrations, he was made, by special grace, a D.D.Sc. of Melbourne University. Mr. A. T. Pitts, in a witty speech, proposed the health of "The Guests," who included the president of the British Dental Association (Mr. S. D. Venning), the chairman of the hospital (Dr. A. W. Oxford), and the members of the Board of Examiners. Mr. Pitts likened the career of the dental student to a microscopical section: hardened by contact with the dean ; his knowledge fixed by lecturers and coaches ; stained at the examination with justice, and counter-stained with mercy ; and, finally, cleared in charity out of the ranks of the candidates. The college then placed a label on him, and the Dental Board cemented him to a brass plate, but, unfortunately, the cement was not so permanent as in the days when he himself qualified, and had to be renewed annually at a cost of three guineas. Mr. C. Howkins, president of the Odontological Section of the Royal Society of Medicine, briefly replied to the toast, saying in what high regard the Royal Dental Hospital of London was held in the provinces. The proceedings ended with the toast of "The Chairman," which was in the hands of Mr. Frank Colman. During the day a very successful clinical "At Home" was held at the hospital in Leicester Square, with a routine operating session in the theatre of Charing Cross Hospital. Exhibitions of clinical cases, skiagrams, and mechanical work were given in the conservation room, orthodontic department, mechanical laboratory, and museum, and attention was specially drawn to some mechanical work of a high standard by students in their first six months.

Health and Cleanliness Council

The annual luncheon and general meeting of the Health and Cleanliness Council was held on November 20th, with Dr. G. F. Buchan, its president, in the chair, and Mr. Geoffrey Shakespeare, Parliamentary Secretary to the Ministry of Health, as guest of honour. Proposing the toast of "The Prosperity of the Council," Mr. Shakespeare said that in many respects the present age was very different from its predecessors. In the past the great cause of action had been the impact of the individual on the community, but a new era had come into being, characterized remarkably by the impact of the community on the individual. It was necessary, therefore, for such valuable societies as the Council to function actively, so that by education the community as a whole might progress as the result of sound habits of health and cleanliness acquired by its individual members. The present age was much more enlightened about the importance of housing in relation to the national health. Very considerable advances had been made in the last few years, but much more remained to be done ; there were still many areas in urgent need of attention. The present epoch was undoubtedly noteworthy for the thought given to health and cleanliness, but the persistence of slum areas was an obstacle to the realization of ideals in various parts of the country. Yet, Mr. Shakespeare added, there were now high hopes of breaking the slum problem in the next five years. The Ministry of Health was profoundly grateful to the Council for the excellent work it had achieved on a voluntary basis to improve the public outlook on health through cleanliness and to remove the causes of disease. Another great move forward would follow when the community realized more generally the importance of physical education. Dr. Buchan, replying to the toast, reviewed the main objectives of the Health and Cleanliness Council. He welcomed the much greater interest which was taken to-day in swimming, but thought that more efforts should be made to ensure personal cleansing before entering swimming baths, many of which were as yet without facilities for this. He called attention to the Council's poster emphasizing this point. During the past year the Council had concerned itself more particularly with the question of cleanliness in the home, but it realized that many factories and workshops could be very much improved in this respect. It had prepared a new housing film to demonstrate good and bad houses, and Dr. Buchan hoped that this might prove as effective as had some of those produced previously by the Council. New ideas as regards propaganda were difficult to acquire. In order

to widen this field there had been a poster competition in art schools, and this scheme would be developed further. Examples of posters submitted were on view which would show those present the great possibilities of instruction in this way.

Central Midwives Board

At the November meeting of the Central Midwives Board for England and Wales an application from the medical officer of health for Liverpool, asking that twenty pupils at a time instead of fifteen might be trained at the Mill Road Infirmary, was granted, provided the number of trained midwives on the staff remains as at present. It was agreed to inform the medical officer of health for Manchester that, on the assumption that the number of trained midwives employed in the maternity unit of the Withington Hospital remains the same as was given in a return made by the hospital authorities in January last, the Board is willing to approve the training of thirty-three pupils per annum at the hospital. A letter had been received from the medical inspector of midwives for Bristol stating that certain midwives in his area were in the habit of giving a drachm of liquid extract of ergot at the end of the first stage of labour, and asking for the Board's observations thereon. It was agreed to reply that each case would have to be judged on its merits, having regard to Rule E 10 (*b*), but the giving of ergot at the end of the first stage of labour, save in circumstances of grave emergency, was regarded by the Board not only as bad practice, but as treatment definitely outside a midwife's province. In reply to the chairman of a Staffordshire nursing association who asked if there was any universal rule regulating the fees of maternity nurses in this country, and what was the attitude of the Board towards the question of birth control, it was agreed to reply: (1) That the question of fees is not one which comes within the official cognizance of the Board. (2) That the Board is of opinion that the giving of advice on birth control is outside the province of a midwife practising as such.

The Medical Ship "Hygeia"

Last Saturday saw a ceremony which marks the passing of the *Hygeia*, the wooden medical ship moored in the River Thames off Gravesend, which has stood since 1922 as a bar between London and infection by shipping from abroad. Her successor, a steel boat, formerly an Admiralty lighter built in 1918, will shortly be towed out from Denton and moored in her place, to become the floating home and surgery of the three medical officers. Representatives of all the river services were present for the naming ceremony, when the daughter of Mr. H. A. Easton, chairman of the Port of London Health Committee of the Corporation of the City of London, broke a bottle of champagne against the side of the new ship at Denton and named it *Hygeia* in place of its derelict sister. After the naming Mr. Easton formally opened the new nurses' block of the hospital close by. The committee of the Corporation and the guests then inspected the hospital before embarking again on the medical launch *Howard Deighton*, and crossing the river again to Tilbury, where at lunch Dr. Thomas Carnwath, Deputy Chief Medical Officer of the Ministry of Health, declared the hospital at Denton "one of the finest isolation hospitals in the world, and one London should not be ashamed to show to the world." Captain Owen, ruler of the pilots, and representatives of the Port of London Authority, the Customs, and the harbour master of Gravesend paid similar tribute to the port medical service. The three doctors on board the *Hygeia* are, through the Guildhall, in wireless communication with the shipping of the world, and they have a "practice" of 750,000 passengers and crews every year, whose health is entrusted to the City of London by Royal Charter. The old wooden hulk, once a windjammer, has carried wreck signs for some time past, a menace to shipping in the river. The doctors have had to work by oil lamps, and the pumps have had to be manned to keep her afloat. In the new ship each doctor has his own bed-sitting room, and there is a lounge, office, galley, and crew's quarters. Work has been speeded up on her for fear the old ship should sink in the night in one of the stormy winter tides. When she is towed away, and the new *Hygeia* takes her place, she will be removed to a spot further down the river, where she can be beached and converted into a men's club ashore.

Reports of Societies

CONTINUOUSLY EVACUATED X-RAY TUBES

At a meeting of the Section of Radiology of the Royal Society of Medicine on November 15th Mr. T. E. ALLIBONE, M.Sc., Ph.D., of the Research Department of Metropolitan-Vickers Electrical Company, Ltd., gave a lecture and demonstration on the development of modern high-voltage *x*-ray tubes permanently connected to vacuum pumps.

Dr. Allibone said that formerly *x*-ray tubes were evacuated by pumps employing mercury as the operating fluid, and the tubes could only be energized from a high-voltage source after the removal of mercury vapour, either by a refrigerant or by a heat treatment and subsequent sealing off from the pump. With the development of a low-vapour-pressure mineral oil, however, the pump could be left in permanent association with the tube, and the tube could then be so constructed as to be virtually indestructible. He described in detail the constructional features of a 250 kV *x*-ray tube thus continuously evacuated. The tube projected from an earthed metal screen, and was capable of being traversed through a vertical distance of four to five feet. Like the Holfelder cannon, it was completely shielded by metal at earth potential, with the advantage that the target was at the end of the tube and not at its midpoint. The minimum treatment distance was 23 cm. from the tube target.

The *x*-ray beam was available in almost any direction in a plane at right angles to the axis of the tube, and by a simple device the target of the tube might be rotated to line up in direction with the selected beam of *x* rays. The whole tube was so enclosed with lead as to reduce stray radiation to the minimum, and thus it was adaptable for use where it was desired to operate more than one tube from one generator; by closing the shutter of the tube it was rendered safe without having to be isolated from the generator and without having to reduce the generator voltage. Curves were shown illustrating the output of the tube, which completely covered the range of intensities in vogue at the present time. To compensate for the admittedly greater complexity of the continuously evacuated tube a completely automatic system of control had been developed, coupled with an illuminated diagrammatic indicator on the control desk. A natural corollary to the tube had been the development of thermionic rectifiers similarly evacuated and automatically controlled. Dr. Allibone also indicated the design of tubes for much higher voltages. If the clinical results of higher voltage treatment were to be clearly separable from those obtained with lower voltages a bigger step in voltage was called for, and he suggested that steps to 500 kV and 1,000 kV should be made. Experimental higher voltage tubes operating in the United States were described. Dr. RALSTON PATERSON and Dr. F. ELLIS described experiences they had had with these tubes during the last two years.

USE AND ABUSE OF INSULIN

A meeting of the Medical Society of London was held on November 25th, with Professor GEORGE E. GASK, president, in the chair, when a discussion took place on "The Use and Abuse of Insulin."

Dr. R. D. LAWRENCE said that insulin was discovered fourteen years ago, came into general use two years later, and had since been increasingly employed; yet although thousands of papers had been published, both on its physiological action and on its therapeutic use, the exact mode of its action was not yet known, nor the

extent of its usefulness fully defined. Therefore, although insulin was an old story, it was not quite a settled problem—if there was such a thing in medicine—and its use and abuse certainly merited discussion. The physiological action of insulin could be most clearly seen in diabetes, where injections of insulin removed completely, though only for a short time, all the metabolic defects. These defects consisted essentially in failure to burn and store carbohydrate food, with resulting high blood sugars, and at the same time failure to metabolize fats, which showed itself in a progressively severe production of acetone-ketone bodies as carbohydrate burning became less and less. A large injection of insulin abolished this diabetic picture completely in a few hours, bringing down the blood sugar, refilling the depleted stores of glycogen in the liver, and less noticeably in the muscles, and causing the acetone production and excretion to disappear. The exact chemical step that insulin took was not known ; probably it was only one step in a wide complexity of carbohydrate chemistry. It was not known whether insulin should be called a hormone, a catalyst, or, partly, an enzyme.

In normal persons when insulin was injected the blood sugar was always lowered, and definite hypoglycaemia was produced if enough insulin was given. Ten units of insulin, given in the fasting condition, produced in most people perceptible symptoms of hypoglycaemia ; fifteen units always produced the condition, and twenty units might produce quite severe symptoms, usually within two hours. The symptoms of hypoglycaemia in normal persons were almost precisely the same as in diabetics—weakness, tremor, and sweating—but particularly noticeable in normal individuals was the feeling of hunger, and this had been turned to clinical use. There was no real evidence that the giving of insulin to diabetics increased or affected their metabolism in any specific way. Normal persons had already enough insulin of their own, and the addition of ten or fifteen units more had no specific action. In the current view of insulin production the giving of carbohydrate as glucose always produced enough insulin to look after the glucose, and the administration of insulin with glucose was unnecessary to ensure that the added glucose would be burned and metabolized.

The main indication for insulin was in diabetes mellitus. In this disease it should be used whenever the utilization of carbohydrate was insufficient to maintain the energy necessary for the demands of life. It was also essential in the treatment of diabetic coma, and for the continuous welfare of most cases under 40, and certainly in all diabetes in childhood. Many mild cases of diabetes did not need it, but most of them would benefit from a little being given. Its use in the elderly mild cases could not be termed abuse, unless in a few in which it was psychologically harmful. The use of insulin was essential in the milder diabetes when complicated by some other illness. Its chief use was to metabolize an adequate diet to keep the patient in normal health, and it was always possible to keep him in normal health unless complicating disease was present. If insulin was not producing this happy result of normal health it was being improperly used, if not abused. The action of insulin was quantitative, and patients on the same diet with different degrees of severity of disease required entirely different doses of insulin to control their condition and keep them well. If a patient who required 50 or 60 units a day were given only 10 units no control over the diabetic condition would be obtained ; if it was a milder case needing only 20 units and 40 were given the resulting hypoglycaemia made the patient's life unhappy. The most common error was to give too little insulin. Many doctors seemed afraid to give doses of more than 10 units twice a day. The proper dose was that which the patient needed, and was always an individual one. Another difficulty was the necessity of varying dosage from time to time. He had never seen a patient who could continue on the same dose of insulin year in and year out, and if the necessary adjustments were not made the patient would not be kept well. In added illness, especially a febrile one, the whole blood sugar picture moved upwards with the same dose of insulin, and ketosis might result and the patient be liable to go into diabetic coma. Therefore in any added illness it was essential to increase the insulin ; this was most easily done by adding to the two daily doses a third in the middle of the day. When sickness and vomiting occurred, if the patient could keep nothing down, it was a mistake to cut off the insulin entirely, but half the usual dose should be given, otherwise the blood sugar would rise.

The management of diabetic patients who were careless about their diet was a great difficulty. Some patients would only take insulin when they felt very ill. These people were always in danger of serious trouble. Others would insist on taking an extra 10 units of insulin on occasion, as, for example, when going to a City dinner. If they knew how to use it there was no particular objection to such occasional irregular use. One of the most serious abuses of insulin was that which was for some time practised in France, though not much in this country, whereby, even in severe diabetes, patients were taken into an institution and given a course of insulin which lasted for two or three weeks, and then were sent out without insulin, to return later, when the symptoms reappeared, for another intensive course. With regard to the use of insulin by non-diabetics he felt on much less certain ground. Insulin had been recommended in many diseases ; there had been a tendency to try it on every metabolic "dog." It had been advocated for fattening the thin and for combating anorexias and preventing vomiting. The claims of insulin to be a general metabolic tonic for normal people had never been satisfactorily substantiated. But insulin could certainly promote appetite, and this might be useful in forcing the anorexic patient to eat. He had seen considerable benefit from it in nervous anorexias, but whether this was due to the creation of hunger or was a psychological effect following the prick of the needle he could not determine. A legitimate use of insulin in non-diabetics was in any condition in which heavy ketosis was present. Insulin had been used in Graves's disease, a katabolic disorder which insulin, with its anabolic action, might reasonably be expected to antagonize, but he did not think it had any fundamental effect, and it was futile in comparison with iodine medication. Finally, as to the effect of insulin on the heart, the diabetic heart was peculiar in that its glycogen content was not diminished, and indeed was usually raised, whereas the liver was depleted of glycogen, which showed that the carbohydrate metabolism of the heart was not dependent on insulin for its glycogen formation. On the other hand, it was quite certain that the diabetic heart utilized more sugar when insulin was given.

Dr. GEORGE GRAHAM showed tables giving the number of deaths from diabetes in England and Wales over a period of years. In recent years, while there had been a fall in the number of deaths at the earlier age periods, there had been a considerable rise in the number at ages 55 to 65, and a quite extraordinary increase at ages over 65. It had to be remembered that people were living longer, and that diabetes was a disease of middle age, but he thought much of the increase might be accounted for by the improvement in diagnosis and the routine of urine examination: very many cases of diabetes in earlier years must have escaped recognition. With regard to insulin in relation to anaesthetics, he recalled an observation of Minot that in using open ether he found a considerable rise in blood sugar, but when patients were given small amounts of insulin, 5 or 10 units, about half an hour or an hour before operation, the blood sugar did not go up. In the vomiting of pregnancy he was told that, as a rule, it was unnecessary to do anything in mild cases, but in severe vomiting sugar and insulin should by all means be given. These people were likely to have a severe ketosis, and therefore needed insulin as well as sugar. Patients with severe boils yielded quite quickly to a small dose of insulin. With regard to abuses of insulin, the chief of these was in not giving enough—that is to say, in not making a greater effort to keep the blood sugar down to normal. Often a person was found with sugar in the urine and it was supposed that he had diabetes, and treatment with insulin was started straight away. But

some of these patients might not have diabetes at all. He had known medical men who had straightforward renal glycosuria, and when insulin came in took it at once and made themselves very miserable.

Dr. FRANKIS EVANS said that with chloroform as an anaesthetic the blood sugar did not rise anything like as high as with ether. If the normal were taken as 100, the chloroform results worked out at about 125, while the majority of the ether results were about 180. With open ether, however, the rise was not nearly so high as when gas was used at the commencement. The gas-oxygen results remained at about 150. The gas-ether sequence was a little suggestive of asphyxia.

Sir JOHN BROADBENT said that a certain number of cases of diabetes started quite late in life, and it was said in some quarters that these people could go on with careful dieting, while in others it was said that they should have a more liberal diet and be given insulin. What carbohydrate tolerance should be taken as a standard? He added that in his experience women diabetics were more difficult to treat than men. The man seemed to accept the insulin regime as a business proposition, but the woman was more self-indulgent, and would, for example, go out to afternoon tea without saying anything about it.

Dr. LAWRENCE, in reply to Sir John Broadbent's question, said that if such people were reasonably well, if not fully active, on 50 grams of carbohydrate, and had no acetone in the urine, he would probably not insist on insulin. But if acetone were present the diet should be raised, if they would tolerate the rise, and he would give them insulin.

Sir WILLIAM WILLCOX said that insulin diminished the mortality from true diabetes. Many of the older people who were classed as diabetics did not die of diabetes but of arteriosclerotic changes associated with glycosuria in old age. One point he desired to emphasize was the effect of toxic conditions. If the diabetic had influenza or pneumonia the insulin must be largely increased—in other words, toxins appeared to neutralize the insulin. One of the abuses of insulin was in administering it to persons with glycosuria without first thoroughly investigating the case for septic foci. Very often in a case which was called diabetes, if a focus of infection was removed, such as septic teeth or tonsils, the glycosuria cleared up, and insulin was not required at all.

HEALTH ON THE RAND MINES

In a review of mining practice on the Witwatersrand given to the Institution of Mining and Metallurgy on November 21st Mr. R. S. G. STOKES said that recent advances in underground hygiene had strengthened the resistance to disease both of the European and of the native worker. During the last five years there had been a gratifying reduction in the morbidity and mortality rates from pulmonary tuberculosis, which was at one time extremely serious among native employees. In order to promote a still further reduction in the incidence of all pulmonary diseases, tests had been conducted on a few mines to ascertain if benefits could be obtained from the issue of sheepskin or serge jackets or woollen jerseys to underground workers. Serge jackets were found the most satisfactory, and were being issued in winter to all natives underground and to certain surface workers. Hookworm infection had been almost wholly eradicated by the liberal use of common salt in and around the latrines, in all stations, waiting places, and man cages, and by the closer control of reclamation places liable to become infected. The incidence of heatstroke, chiefly among the native labourers as opposed to the European supervisors, became exceptionally serious about 1930. Since then there had been a steady improvement in preventive measures. The improvement was due to the use of methods of underground acclimatization and supervision of new "boys" before their allocation to dangerously humid workings. Recent systematic investigations into the acclimatization of native labourers and the measurement of their heat susceptibility, notably by the medical officer of the City Deep Mine, had distinctly advanced knowledge of an important subject. At first chief reliance was placed upon the institution of a long acclimatization period underground for all new natives, which imposed great difficulty and expense and was by no means a foolproof or reliable system. Briefly, the new scheme evolved, said Mr. Stokes, was based on the systematic medical examination on surface of all new natives, who were submitted to a period of hard muscular effort in an experimental heat chamber. The test was performed in stagnant air at 95 degrees, saturated, and, in the light of reactions obtained, the subjects could be divided into "heat tolerant," "heat intolerant," and "normal" groups, according, *inter alia*, to the rise in temperature recorded during the first test. Unless rejected altogether, their underground acclimatization period could be regulated with safety in the light of these classifications. About 20,000 new natives had already been submitted to test. Poor physique had been shown to be not a guide to heat susceptibility. The rise in body temperature was little dependent upon body weight, height, or "cooling surface." Natives from the hotter tropical areas were the most tolerant, and the benefits of acclimatization were soon lost when work underground was suspended.

Mr. F. E. KEEP, who had recently returned from the Rand, said that five years ago on the deeper mines hookworm infection was an absolute scourge. The shift "bosses" were informed of the likely spots for hookworm larvae in the parts of the workings for which they were responsible. Specimens of the soil were thereupon taken and sent for examination to the medical bureau, and if the results were positive "that shift 'boss's' section resembled a snowstorm for the next fortnight, owing to the abundance of salt that was used." But the measure had proved effective. With regard to heatstroke, the number of fatalities had been reduced, though not the incidence of the complaint, by the use of lobeline. Officials were instructed to carry this preparation at all times, together with a hypodermic syringe, and on a heatstroke case being reported to them they immediately gave the "boy" an injection, which had proved very efficacious in saving life. On questions of more general hygiene, it was stated by Mr. Stokes that compound design had been improved, with a restriction of the number of "boys" to each room, and it was also the general practice to erect shelters at the shaft-head for natives awaiting the cage when the compound was at any distance. Less successful had been the attempt to accustom all natives to take breakfast before going underground. The raw native had an innate indifference to any meal too meagre to induce gratifying distension.

PSYCHOPATHOLOGY

At a meeting of the Medical Society of Individual Psychology held on November 14th Dr. J. A. HADFIELD delivered an address entitled "A Contribution to Psychopathology." He suggested that a working basis of psychopathology was possible which was independent of the hypothesis of sexual libido as a primary urge upon the elaboration or perversion of which subsequent equilibrium would depend. This basis was provided by an investigation into the infant and child life in relation to maternal protection and love. He suggested that such investigation would provide the necessary help to the understanding of many of the neuroses and psychoneuroses. Anxiety and other emotional states and many psychoneuroses such as hysteria and delinquency appeared often to be related to the deprivation of protective love rather than to sexual repression on the one hand or organ inferiority on the other. The specific symptom was, he suggested, conditioned by the state of mind of the child at the time of deprivation; and such state of mind was often determined by the age and stage of development of the child. Thus depression, sex perversions, and anxiety states usually originated in the first year of life, obsessional states in the second year or aggressive phase, conversion hysteria about the age of three, and delinquencies in the phase of independence at four.

SOME PROBLEMS OF PUBLIC HEALTH

At a meeting of the Section of State Medicine of the Royal Academy of Medicine in Ireland on November 15th, with Dr. KERRY REDDIN in the chair, Dr. J. A. HARBISON gave a presidential address on "Some Present-day Public Health Problems."

Dr. Harbison spoke first of the need for educating the public in health matters so that the preventive idea should permeate the lives of the people. Infant mortality, and especially neo-natal mortality, was a problem not less urgent in the Free State than elsewhere. He had found that a number of stillbirths in his own area were associated with lack of skilled attention at birth. Maternal mortality rates were no better in the Free State than in Great Britain, and their knowledge of the causation and treatment of puerperal cases was still very meagre. Research into the causation and treatment of puerperal conditions would be facilitated by the establishment of a special puerperal unit to serve the city and county of Dublin. It should not be too readily assumed that all pathogenic organisms would yield specific products of immunizing value. The common cold and influenza were examples of diseases in which vaccine prophylaxis was of limited or doubtful value because of our ignorance of the exact part which one or other organisms played in their causation. Reviewing the existing public health services, Dr. Harbison showed how State and rate-aided effort was now concentrating on the personal welfare of the individual citizen rather than on his environment. Many problems awaited solution—child nutrition, heart disease, acute and chronic rheumatism, and cancer, to mention only a few. In their elucidation, and in the prevention of the volume of ill-health with which these problems were associated, the Public Health Service had a part to play, but unless the full co-operation of every section of the medical profession were available preventive medicine would not achieve the success it deserved.

Dr. KERRY REDDIN said that the prevention of infant mortality was largely a problem of educating the mothers. Pre-natal care for every pregnant woman was essential if the neo-natal rate was to be lowered. During the last seven years the number of mothers receiving pre-natal care in Dublin had increased from 800 to 4,000 per annum. Notification of stillbirths had not been as complete in some hospitals as it might have been. Puerperal cases should be sent to one centre, which he thought ought to be situated at the City Fever Hospital. Dr. J. P. SHANLEY urged the need for friendly co-operation between the medical officer of health and general practitioners. Institutional provision for mentally defective children in the Free State was inadequate, he said, and this was a matter requiring the urgent attention of the Public Health Service. Professor J. W. BIGGER thought that the public should be taught about disease prevention, and the teaching should be done by the medical profession. Undue stress had been laid upon the dangers of child-bearing in recent years. The expectation of life of the pregnant woman at 25 years of age was not much less than that of the non-pregnant woman at that age. Professor W. D. O'KELLY questioned the wisdom of completely protecting children from measles and whooping-cough, referring to the dire results experienced in the Fiji Islands when measles was introduced into a highly susceptible population. He wondered how many of the medical attendants at midwifery cases were carriers of haemolytic streptococci. Maternal mortality rates had no doubt been unduly stressed, but the most recent figures gave no grounds for complacency. Dr. W. R. F. COLLIS thought that infant mortality was a far more pressing problem than maternal. Infant deaths were too often regarded as inevitable. It was very important that the infant's temperature and weight should be recorded during the first few weeks of life. Dr. ELLA WEBB referred to the delay on the part of mothers in seeking skilled aid for their ailing children. Routine diphtheria immunization at the Children's Convalescent Home, Stillorgan, had been a great success.

Professor R. J. ROWLETTE stressed the need for team work in the management of cases of puerperal infection. He thought that the president's address would stimulate action in many directions for the public good. Dr. C. J. MCSWEENEY referred to the need for rheumatism supervisory work in Dublin. Much of the heart disease met with in adult life was preventable, but if a scheme for dealing with rheumatic children was to succeed it must be linked up with the school medical and child welfare services. There was urgent need, too, for the ascertainment during school age of mentally defective children, so many of whom were educated outside institutions. Dr. DOROTHY PRICE said that a great many infant deaths were due to acute tuberculosis, and gave some recent experiences of her own in this connexion. It was difficult to escape the conclusion that these children were infected by their mothers. Dr. G. TIERNEY emphasized the need for surgical facilities in the hospital unit devoted to puerperal cases. Many fever hospitals had not such facilities. Dr. J. C. FLOOD said that education in health should be given only by those in the Public Health Service. Medical officers of health were not specialists, but represented the vehicles through which public health knowledge was disseminated.

The PRESIDENT, in reply, dealt with the various points raised, and said that the establishment of a Central Hospital Bureau for Dublin was overdue. Such a bureau would serve as a centre of information as to where beds for different types of cases were available, and so much of the inconvenience and annoyance now experienced in securing admission to hospital would be obviated.

CORRESPONDENCE

Death in the Asthmatic Attack

SIR,—The leading article on death in the asthmatic attack (*Journal*, November 16th, p. 955) suggests some comment. The circulatory disturbances mentioned in the latter part of the article have already been mostly well known in this country. On the other hand, the post-mortem findings in the middle-aged woman who first developed asthma shortly after narrowly escaping death by electrocution can hardly be expected to teach us much about asthma as seen every day clinically. The illness had its beginning in a gross traumatism, probably with much tissue damage, release of histamine, and consequent flood of eosinophil-laden mucus. The dilated bronchioles and atrophied bronchiolar muscle are the reverse of the usual findings. One cannot help wondering whether bronchoscopic suction would not have helped to give relief to this patient.

But what specially interests me is that trouble was taken to investigate the adrenals—found normal, as was not unlikely in such a case. Considering the value of adrenaline in asthma it is amazing how pathologists have neglected to examine these glands in necropsies of asthmatics. Goldzieher[1] confesses his inability to find such record; Coca, Thommen, and Walzer,[2] in their summary of thirty-three necropsies, make no mention of the condition of these glands. I have already recorded[3] three cases with gross damage, especially in the medulla; the patients had asthma steadily increasing till death. I have since had the adrenals examined in three more. Except for some oedema in one and perhaps unusual size in another they were normal microscopically; the asthma, however, in all, though intractable, had not been of long duration.

The clinical history of some patients suggests that senile decay may hit first or most the adrenals, as in others it hits the thyroid. But it is important to have this surmise histologically investigated. It is important for another reason: to enable us to differentiate such a

[1] *The Adrenals* (Churchill).
[2] *Asthma and Hay Fever*, p. 158.
[3] *Glasgow Med. Journ.*, 1931, p 81.

condition, if it does exist, from cardiac asthma, said by Volhard to result from imbalance between the two sides of the heart—a very different thing pathologically from bronchial asthma or senile decay of the adrenals, yet a very difficult thing to differentiate clinically.

This letter is a plea for systematic investigation of the adrenals in every clinical condition for which the label "asthma" occurs to one's mind. We may thus become able to sort out the different diseases at present labelled by their common symptom, asthma. Probably it would be wise, as suggested by my friend Dr. Munro Cameron, who did most of the aforementioned necropsies, to include the pituitary in the pathological investigation.—I am, etc.,

Glasgow, Nov. 23rd. JAMES ADAM.

Treatment of Paralytic Ileus

SIR,—The discussion on paralytic ileus at the Section of Surgery of the Royal Society of Medicine, reported in the *Journal* of November 16th, opens up a problem of universal interest, for, as Professor Grey Turner aptly remarks, these cases are desperate, and it is very difficult to know when it is proper to intervene or when they should be left alone.

Paralytic ileus following peritonitis may be either partial or complete. Partial paralytic ileus responds in varying degrees to purgatives, enemas, and such drugs as pituitrin, eserine, or acetylcholine. These cases will usually recover if handled with judgement and care. One should, however, be on the look out for superimposed mechanical obstruction, and if this should occur operation at the earliest possible moment must be carried out. Ileus with a superimposed obstruction can easily be diagnosed by the onset of colic-like pains and visible peristalsis. It is in this type of case that the operation described by Mr. Sampson Handley is so brilliant and successful. A fresh incision should be made in the upper abdomen, and if the large bowel is not unduly distended an enterostomy between the small bowel and the transverse colon will be sufficient. Should the large bowel be greatly distended it is impossible to state whether a double obstruction is present or not, and a colotomy must be added to the enterostomy. I find the left inguinal colotomy as effective as a caecostomy, and far more comfortable for the patient.

Complete paralytic ileus, in which there is no response to drugs, is a far more serious, and often fatal, condition. I believe that all forms of paralytic ileus result from toxaemia, which paralyses the nerve endings in the intestine. This toxaemia is very intense, and it is little wonder that operative intervention in these cases leads to such deplorable results. If Mr. Sampson Handley's reasoning is correct—that is, that in the early stages the jejunum and transverse colon are not paralysed—then the treatment of paralytic ileus would be simple and clear-cut. My own experience, and that of many other surgeons, does not bear this out. If, on the other hand, the ileus is due to a toxaemia, then the whole bowel must be involved in the paralysis. I cannot recollect a single case where an enterostomy was life-saving unless superimposed obstruction was present. I do not wish to enter into the numerous methods for the treatment of paralytic ileus, but I believe that without superimposed obstruction operation should have no part in its treatment.

Anaemia of the pernicious type following enterostomy, as mentioned by Mr. Sampson Handley, is a reality which all surgeons should keep in mind.

Eight years ago I operated on a lady who had increasing signs of intestinal obstruction. Five years previously she had an internal strangulated hernia through a congenital aperture in the mesentery of the small intestine, and very nearly succumbed. The operation had to be completed before the aperture could be closed. I was fortunate enough to see this aperture when I opened the abdomen, and was able to close it. The lower half of the small bowel was one mass of adhesions, so that it was impossible to find the actual site of obstruction; my only course was an enterostomy with the transverse colon. She made a good recovery, and since then has had no signs of obstruction. Four yours later she developed signs of severe anaemia of a pernicious type, and has since relapsed on three occasions. It is difficult to fix a definite cause for the anaemia, but the patient in question has always had a tendency to diarrhoea and a distaste for food. It may be that the distaste for food results from the fear of diarrhoea, and hence starvation occurs.

The higher the jejunum is anastomosed to the transverse colon the more likely will diarrhoea result, and consequently less nutriment is absorbed from the bowel. This point would probably decide the earlier onset of anaemia in this case.—I am, etc.,

Hereford, Nov. 25th. R. WOOD POWER.

Prophylaxis in Puerperal Sepsis and Pyrexia

SIR,—With reference to the article appearing in the *Journal of Obstetrics and Gynaecology of the British Empire* for June 15th, and an abstract of that article in the Epitome of the *Journal* of November 2nd, I have given in the accompanying tabular statement a record of cases treated in this institution by various methods—namely, acriflavine, vaginal soak, vitamins A and D, and antitoxin—and in the second part of the same statement I have given the number of cases that have been treated in the institution over a period of two years with calcium sulphide, in doses varying from 1½ to 12 grains per twenty-four hours.

Cases Treated by Various Methods from 1927 to 1933 Inclusive

Patients Confined in Hospital	Patients Confined before Admission	Abortions
Total number 5,421	303	957
Deaths from sepsis 29	2	4
Rate per thousand 5.3	6.6	4.1

Cases Treated by Calcium Sulphide from 1933 to 1935 Inclusive

Patients Confined in Hospital	Patients Confined before Admission	Abortions
Total number 2,518	124	315
Deaths from sepsis 2*	2†	1
Rate per thousand 0.7	16	3.4

* *Confinement.*—Emergency case, post-mature pregnancy, suffering from pyelitis, cord prolapsed one hour after admission, eclampsia four hours later, patient unconscious for twenty-four hours. Thirty-six hours later forceps applied, but failed to effect delivery; craniotomy performed. Child weighing 12½ lb. delivered. Patient died of *B. coli* septicaemia seventy-seven days later.

Emergency case, attended by doctor and midwife for three days before admission; delivered piecemeal of a rotting foetus; mother died of acute sepsis thirty-six hours after delivery.

† *B.B.A.*—Complete prolapse of the uterus; premature birth; haemolytic streptococcus on swab from cervix on admission. Case removed at once to isolation hospital.

B.B.A.—Adherent placenta; placenta delivered spontaneously after admission to hospital.

It will be observed in the former series that the death rate from sepsis per 1,000 was 5.3 in cases confined within the institution, and under treatment with calcium sulphide the death rate is 0.7 per 1,000. The results of treatment show that calcium sulphide, used either as a prophylactic previous to confinement or even during the puerperium, not only acts in preventing the incidence of puerperal infection but also does much to curtail the mortality. The pyrexial rate according to the Ministry

of Health's standard during the years 1927–33 was 58.2 per 1,000, while during the last two years this rate has been reduced to 12.5 per 1,000, inclusive of cases confined in hospital, B.B.A.s, and abortions. During the past two years the mortality rate from sepsis in cases confined by doctors and midwives within the county of Lanark (this local authority's area) still stands at 3.5 per 1,000. Cases admitted after delivery are admitted on account of some complication—as, for example, post-partum haemorrhage, adherent placenta—or because the housing conditions are unsatisfactory for the careful nursing of the patients. All abortions are admitted at the request of the general practitioner. Finally, an additional handicap in the prevention of puerperal sepsis is the fact that almost 60 per cent. of the insured population are unemployed at the present time, and practically all admissions are wives of insured persons.—I am, etc.,

County Maternity Hospital, Bellshill, Lanark, Nov. 20th. H. J. Thomson.

Diet and Puerperal Sepsis

Sir,—I would like to emphasize the importance of one branch of this subject, which I brought forward at the debate arranged by the Fellowship of Medicine last week. And this the more because it was not touched upon by any other speaker at that debate, and because it is rarely dealt with in any of the discussions upon the reasons for the persistently high mortality through puerperal sepsis.

Let me put it this way. No obstetrician would knowingly deliver a woman in a room under which there ran a permeable sewer. He would either remove the sewer itself or would take steps that no sewage should pass through it. In many ways the surgeons of a century ago were as technically skilful as the surgeons of to-day, but their mortality was high because they neglected to use clean hands and clean coats. The modern obstetricians continue to get a disgracefully high mortality because they neglect the frequent presence of sewage! Under certain conditions the lower end of a woman's alimentary canal is an actively infective sewer, and to allow this condition to continue to exist during parturition is wholly inexcusable.

Nature has evolved a cure for this dangerous condition in animals in which it might otherwise normally exist. Nature has so shortened the alimentary canal of carnivorous animals that the faeces are evacuated at the stage at which they are about to become septic. Nature has so markedly emphasized the dangerous nature of these potentially septic faeces that she has taught carnivorous animals to cover up their excreta immediately it is passed. To watch a cat carefully scoop a hole and then afterwards cover it over is a lesson in Nature's prevision as to the danger of such faeces.

How can intelligent human beings copy Nature? In the case of a human mother the method would be to cut out the descending colon from every woman so soon as she becomes pregnant! This would reduce puerperal sepsis, but under our present knowledge would replace one evil by a still greater one. If, then, we cannot remove the sewer, can we change its contents into a comparatively sterile condition?

Nature has solved this problem also. In the case of the herbivorous animals she has very long intestines to deal with, but she uses them for substances which are comparatively free from pathogenic organisms. There is no need for horses or cows to cover up their droppings. In India I learned the value of fresh cow dung for making floors of a character which secured freedom from low injurious organisms. Intelligent man in this way can also copy Nature. He can change the intestinal flora from a pathogenic to a beneficent character. Every woman as soon as she is pregnant should be put upon, and during pregnancy should be kept upon, "a diet of pregnancy." We are apt to rail at the ignorance of the old midwife, but a certified nurse who has been taught that a dose of castor oil at one end of the alimentary canal and an enema at the other is of value for securing internal aseptic conditions in midwifery is a danger wherever she goes!

With regard to "the diet for pregnant women," I need do no more than remind your readers that, as an example, the action of the coli group of bacilli, which inhabit the lower bowel, depends on their food. From being benignant workers in the bowel in a medium of cellulose, starches, sugars, and cereal and milk proteins, they may become virulent migrants in the presence of breaking-down animal proteins. No woman is free from risk of puerperal sepsis in whose colon may be found *B. coli* of a migratory type and capable of passing through the mucosa. Where such *B. coli* exist the presence of streptococci as companions makes the conditions still more dangerous. I always hand to every pregnant woman who consults me a booklet of advice upon dietary, as being one of the most important of ante-natal precautions.—I am, etc.,

London, E.C., Nov. 18th. Josiah Oldfield.

Anti-scarlatinal Serum in Erysipelas

Sir,—I was greatly interested in the valuable contributions to this subject by Dr. W. H. Brazil, Dr. H. G. Watson, and Dr. R. A. Lattey, whose excellent results are in accordance with expectations. The different clinical manifestations exhibited by members of the haemolytic group are, as we know, governed by such factors as the invasiveness and toxigenicity of the attacking strain, the site of initial attack, and the degree of local and general immunity of the host; and however one strain of the group differs from another serologically, the toxin produced is identical for the whole group. Hence the specific antitoxin, which anti-scarlatinal serum precisely is, would be expected to exercise a materially beneficial effect, other things being equal, in erysipelas and other haemolytic streptococcal infections. And what one expects to find in theory is borne out in practice by results such as those of your correspondents, to whose list I can add two further cases of facial erysipelas which made a similarly satisfactory response to this treatment.

If I may be allowed to make a suggestion, I think it would avoid much ambiguity if the term "anti-streptococcal serum" were exclusively reserved for the antibacterial class of streptococcal sera—univalent and polyvalent—with which one is more accustomed to associate the term.—I am, etc.,

Belfast, Nov. 18th. H. F. Selwood Lindsay.

X-Ray Treatment and Subacute Bacterial Endocarditis

Sir,—I was much interested in Dr. Herbert H. Brown's letter in your issue of November 16th, in which he advocates the trial of *x*-ray radiation in subacute bacterial endocarditis. With the co-operation of Dr. Forbes Lawson, radiologist, I have already tried *x*-ray treatment on two such cases. The treatment consisted of very small doses of deep *x* rays over the cardiac area. Both these cases were hopelessly advanced before treatment was begun. Although positive results could not be hoped for, it was possible to observe that the treatment did not appear to have any immediate ill effect.

As it happens, I have two cases of subacute bacterial endocarditis in Leicester Royal Infirmary at the moment, and deep *x* rays are being tried on both. The treatment

consists of one-twelfth of a skin dose at intervals of three days, observing the reaction. I shall be glad to let Dr. Herbert Brown have full details of these cases if he would like them. Very briefly, however, their features are: *Case 1:* pallor; marked pyrexia, clubbing; spleen palpable; no petechiae; blood culture positive; mitral lesion. *Case 2:* pallor; moderate pyrexia, slight clubbing; spleen palpable; no petechiae; blood culture negative; mitral lesion.—I am, etc.,

Leicester, Nov. 19th. J. P. W. JAMIE, M.D.

X-Ray Treatment for Local Infections

SIR,—Your issue of November 16th contains letters on the serum treatment of erysipelas and on *x*-ray treatment of certain cases of microbial infection. As to erysipelas, I do not wish to go into the respective merits of serum and *x* rays; my object is to point out that prompt *x*-ray treatment is at any rate *one* of the ways of saving life in erysipelas of the head and neck. Some years ago I published in the *Journal*, jointly with Dr. R. H. Jamieson, an account of certain cases of erysipelas in which life was apparently saved by *x*-ray treatment. Did space permit I could add many more. Erysipelas of the head and neck, and also spreading carbuncle of the kind dangerous to life, may be checked by small doses of *x* rays, such as can be given by a portable apparatus.

Dr. H. H. Brown's claims (p. 970) are not, in my opinion, exaggerated, and his suggestion as to endocarditis deserves consideration. In one thing, however, he is too modest: he says, "it is *even* claimed [italics mine] that some cases of chronic arthritis may derive benefit from *x*-ray radiation." I can assure him that the claim is well substantiated. He will find chapter and verse in the proceedings of the Section of Radiology of the Royal Society of Medicine (February and May, 1932). Many sticks have been thrown away as a result of *x*-ray treatment; but one must remember that their erstwhile owners were suffering from osteo-arthritis; in rheumatoid arthritis the value of radiation is very limited.—I am, etc.,

London, W.1, Nov. 21st. F. HERNAMAN-JOHNSON.

Persistent Vomiting

SIR,—I am interested in Dr. J. C. Lyth's article in the *Journal* of November 9th on to-day's use of yesterday's drugs. As to the use of phenol as a gastric sedative, he will find it recommended many years ago by Sidney Martin, in a treatise on medicine for which he wrote a section.

In the modern methods used in *x*-ray therapy, persistent vomiting is very rarely seen, but an occasional case does occur: such a case is very rarely controlled by the administration of phenol, but I have come across a method for controlling this condition which in my experience is far superior to all others. It was introduced to me about a year ago by Dr. E. T. Wright, but an Australian friend of mine, Dr. J. L. Jona, tells me that he has used it for over fifteen years. The method is the administration by the mouth of 10 minims of liquor adrenalinae hydrochloridi as frequently as necessary up to six doses, or even more, in the twenty-four hours. I imagine that the action must be due to a local effect on the vessels of the gastric mucosa. I doubt if the minute amount of chloretone used as a preservative can possibly account for its effect, though ordinary doses of chloretone (10 grains) are very often quite effective in preventing vomiting. I understand that it is not only for *x*-ray sickness that adrenaline is of use, but it is equally effective in other forms of persistent vomiting.—I am, etc.,

London, W.1, Nov. 19th. N. S. FINZI.

Tuberculosis Among Students and Nurses

SIR,—The annotation in the *Journal* of November 16th (p. 957) tempts me to draw attention to the state of affairs at one of the London teaching hospitals. Of the last twenty-six residents six are down with active tuberculosis—two tuberculosis of the kidneys, and four tuberculosis of the lungs. A little reorganization of the work and insistence on one week-end a month spent away from the hospital precincts might have prevented some of these cases. As the residents are not paid for their work, a compulsory week-end in a few cases might prove a strain on empty pockets; but surely this is better than exposing the more brilliant of the students to the risk of developing tuberculosis.

If over 20 per cent. of the workers in an East End factory developed tuberculosis the Ministry of Health would take strong measures, and the "left Press," with some justification, would print columns on the injustice of sweated labour and the vileness of the capitalists who batten on the life-blood of the workers. Because this happens among the resident medical officers in a London hospital no notice is taken, and the governors, who are presumably responsible, sit in undisturbed complacency priding themselves on the economical running of the hospital, much of the saving being effected at the expense of penniless young doctors.—I am, etc.,

November 25th. AN OLD RESIDENT.

Inexpert Radiography

SIR,—Will you allow me to endorse the remarks by "Radiologist" in your issue of November 23rd. I am constantly being sent *x*-ray pictures "taken by dental surgeons" which are valueless from the point of view of determining whether the teeth furnish a focus of sepsis sufficient to explain the changes one has found in the eyes. Very frequently the photographs are incomplete, in that they do not show the apices of the teeth, which, from the ophthalmic surgeon's side of the question, are the most important parts of all. Secondly, the pictures are often out of focus, and the definition is so poor that no reliable opinion can be based on them. I have never yet seen really first-class pictures taken by a dental surgeon, but, on the contrary, I have had a large number of these sent me which are of so little value that I have had to insist on proper photographs being taken by an expert radiologist.

One can understand that where the services of a reliable radiologist are not available, as, for instance, in far-away parts of the Empire, such efforts by general or dental surgeons may be very valuable, but here in London and in most parts of Great Britain, where excellent pictures can be obtained without difficulty, this amateur business ought to be put a stop to. It is unfair alike to the surgeon and to the patient.—I am, etc.,

London, W.1, Nov. 23rd. R. H. ELLIOT.

SIR,—If your correspondent "Radiologist" (November 23rd, p. 1021) has something important to tell us why does he remain in his dark room as an anonymous writer? As far as the patient is concerned—and he is the first consideration—two courses are open to him: if he lives in a town of 6,500—

1. He may go to a local doctor who has a plant or to the hospital for his examination. In either case the films may not be as good as "Radiologist's," though they were sufficiently clear for a diagnosis of diverticulosis to be made; the interpretation is obviously far behind "Radiologist's." examined him or sent him is fully cognizant of his whole Against these is the overwhelming fact that the man who clinical history.

2. He has his examination at the hospital on (say) Monday, and if he is alive on Saturday (say) the result is reported to him by the radiologist on his weekly two-hour visit when he examines the whole of the week's films without having time to read a single clinical note or to see a patient before he dashes off to his next hospital. Between his visits the local doctors do the interpretation as best they can.

"Radiologist" complains that the average practitioner has little knowledge of interpretation; but whose fault is that? So far I have been able to attend one course of clinical radiology—a private one given by Dr. L. A. Rowden, and one without which I could have done nothing. Anyone desiring to learn about eyes, ears, bacteriology, or pathology, etc., attends courses of lectures. The only course open for the practitioner who desires to learn *x*-ray interpretation is to study for the diploma for one or two years.

Of the two courses open to the patient I should prefer the first, in spite of the local doctor's poor technique and poorer interpretation. The travelling radiologist is, to my mind, the real danger, both to medicine and to radiology. As an ideal, give me the stationary radiologist who is not afraid to visit the operating theatre and knows the way to the post-mortem room, where he can correct or confirm his diagnoses. After all, "Experience is the name we give to our mistakes."—I am, etc.,

A. P. Bertwistle, F.R.C.S.Ed.

London, W.1, Nov. 24th.

Sir,—I agree with "Radiologist" that our interpretation of radiographs is not what it ought to be, but can he tell me of any books or lectures which I could attend? Not only do I have difficulty in reading films of my own cases, but also in understanding the radiologist's report on barium meals, etc. Is there any museum which I could visit? I have neither the time nor inclination to devote two years to getting the diploma, which would be useless in my country practice.—I am, etc.,

Holbeach, Lincs, Nov. 25th. W. Watson.

Medical Assessors

Sir,—May I offer a word on one or two points arising from the letters on this subject in your issue of November 16th. Having "sat" as assessor in workmen's compensation cases on many occasions, I am not unacquainted with what Mr. Gibson calls the "spectacle of conflicting medical evidence," but, though sometimes moved by a brotherly sympathy for a colleague who was being "put through it," have never regarded it as a spectacle, much less as an "unedifying exhibition," as Mr. Shiel puts it. It ought, I think, to be kept in mind that only a small proportion of claims for compensation under the Act come into court, and where disagreement does arise it is hardly fair to either party to ascribe this to the workman's anxiety to get the best out of his injury and the insurance company's anxiety to guard its funds.

A large proportion of disputed cases are decided by the procedure which does not differ very much from one advocated by Mr. Gibson—that is to say, reports on behalf of each party are submitted to the referee, acting alone, who frames his decision on what he himself finds. I am sure that any of your readers who have acted in this capacity will bear me out when I say that these references often present real difficulty, and entail much care and thought in arriving at what the referee hopes is a reasonable decision. The sense of individual responsibility is pressing, and at times, with every care to form an equitable judgement, one has presented a report which has incurred somewhat searching criticism by the authorities.

I have little doubt that should the administration come to the conclusion that the existing machinery is unsatisfactory, steps will be taken to amend it, but the establishment of a medical board suggested by your first correspondent would not, to my mind, be an advance. For one thing, it would require to be accompanied by legislation making it incompetent to lead medical evidence in open court, otherwise it would be quite feasible for one or other legal representative to put a witness in the box to put forward an alternative to the report of the board. Further, I do not believe that a board would be in a position to give the long consideration to the terms of its report that is often essential, and I have a strong feeling that the members, conscious that each was sharing his responsibility with the others, would be too ready to present the first agreed decision that occurred to them, and that a decision quickly arrived at might not be the most equitable.

Mr. Gibson wants to keep medical witnesses out of the courts, Mr. Shiel to ensure their greater competence for their task. I am sure that the latter is the ideal to be aimed at, and that under these circumstances there need be no reproach cast by ourselves or others on the conflict of opinion often seen, and likely to be seen in the future if the medical profession is prepared to accept its just responsibilities. There is a certain amount of misconception as to the function of an assessor. I hope I am not "as pragmatical and opinionated as the contending witnesses" to whom Mr. Shiel refers. The assessor gives no evidence, he offers no opinion. It is not true to suggest, as has been hinted to me by a curious colleague, that in the privacy of the judge's room the medical evidence, which may have occupied some hours of the court's time, is gently set aside and replaced by what the assessor may think of the matter. The fact is that medical evidence in many cases is not nearly so conflicting on the essential points as it appears to be at first sight, and one of the chief duties of the assessor is, to my mind, the reconciliation, so far as possible, of any opposing medical testimony. He may, of course, during the hearing of a case, form his own opinions on the merits of one side or the other, but the only way in which he can put forward such opinion is by inviting that of a witness on any point which so suggests itself to his mind.

There is, however, another conflict which has frequently impressed me, not only in court, but in conversation with colleagues and lawyers. There is a fundamental difference in the working of the mind trained in medicine and that of the man of law, and this is a much more difficult gap to bridge than that between opposing witnesses. Too many of us think we have made a praiseworthy approach to the lawyer's point of view if we call the femur the thigh-bone and the patella the knee-cap. Mr. Shiel speaks of our "science which yearly grows more exact," but for each problem in medicine which is solved there is another around which there rages a fiercer controversy than before; and it is because the fully informed medical witness is not and cannot be exact, while the lawyer is striving to make the issue narrow and yet more narrow, that irritation sometimes arises between the solicitors' table and the witness-box. In other words, the lawyer is trying to pluck figs from thistles; too often, unhappily, the thistle itself gets stung.

Medical opinions are constantly changing; judges are bound by decisions which their brothers may have given many years ago. Year by year the scope of the term "accident" is widening. The House of Lords decides that under certain circumstances such conditions as spontaneous rupture of a thoracic aneurysm, coronary occlusion, and bronchopneumonia are accidents within the meaning of the statute. To us this may well appear

ridiculous ; on the judges it is binding. The cleavage between two such lines of thought may be deep, but intolerance can only make it deeper, and I have an uneasy feeling that any approach to intolerance as between these two communities is more on our part than on that of our legal friends.—I am, etc.,

Dundee, Nov. 17th. JAMES M. STALKER.

Chronic Suppurative Otitis Media

SIR,—The paper read by Mr. Graham Brown at the meeting of the B.M.A. at Melbourne when he opened the discussion on the treatment of chronic suppurative otitis media, and published in the *Journal* of November 23rd, apart from the subject-matter, is important, as it may be taken to represent more or less the view of a large number of specialists, and also because of the author's position and experience.

The paper will certainly be read by all those who devote themselves to ear, nose, and throat work, as well as by a large number of practitioners situated out of reach of a hospital with special departments. We shall all get enlightenment from this paper, but I think more was possible. First, it would be well to state why the suppuration in an ear becomes chronic, and when this occurs. Secondly, treatment of otorrhoea after the acute condition has subsided is straightforward if we first discover what is keeping up the discharge.

Personally I have an objection to zinc ionization being classed with peroxide of hydrogen, rectified spirits of wine, cleansing solutions, and fluids of various salts. "Antiseptic" solutions often fail to cure chronic otorrhoea due to sepsis alone in an accessible position even after many instillations, whereas a weak solution of zinc sulphate plus the electric current cures many of such cases with one application. A consideration of the actions taking place in the two methods will explain the difference in the results, and lead to the belief that zinc ionization is the method most worthy of the name "antiseptic" in the treatment of chronic suppuration of mucous membranes and raw surfaces (see *Practitioner*, 1934, i, 272).

May I support those who do not as a rule resort to operations on the tonsils and adenoids to the neglect of measures which help the *vis medicatrix naturae*. As the symptoms of adenoids in children may be due to inflammation in the post-nasal space secondary to rhinitis, such things as post-nasal discharge and Eustachian obstruction often disappear by treatment of the nose by diastolization.—I am, etc.,

London, Nov. 26th. A. R. FRIEL, M.D.

Medical Science and Social Progress

SIR,—I would like to congratulate Dr. J. J. Macnamara on his letter to the *Journal* of November 16th (p. 975). It is an inspiring thing to know that there are humble members of our great profession who have the courage to defend the eternal verities against pagan ideals, even when the latter may be enunciated by the distinguished and cultured President of the Royal College of Physicians. What many of these great reformers seem to forget is that physical well-being, though greatly to be desired, is not the beginning and end of all things. Man's greatest glory was, is, and always will be the triumph of the spirit over the flesh. I myself have good reason to know that those responsible for the upbringing of a large family "though very poor may still be very blessed."—I am, etc.,

DONOUGH W. MACNAMARA.

Corofin, Co. Clare, Nov. 19th.

Birth Control in Modern Life

SIR,—The use of contraceptives is now an established practice among all classes in this country. Those who are most active in its propagation (if one may use such a word in this connexion) may act from the highest motives. I would suggest, however, that the average man or woman who employs these methods does so in order to enjoy sexual freedom without the risk of the responsibility of having children. Whether one approves or disapproves, it is a point of view not very difficult to understand.

Now I have read many articles for and against the use of contraceptives, and I have remained comparatively calm ; but reading your issue of November 23rd I must make a protest. Sir Walter Langdon-Brown, speaking at a debate on birth control at the Hunterian Society, states (referring to his experience as extern at a large maternity hospital) :

> "That steady stream of unwanted babies has haunted me ever since. There were times when I had to get away and walk on the banks of the Thames in order to feel that there was some beauty in life and some reason in existence."

I, too, worked in a large maternity hospital, and what struck me was the unfailing welcome for each baby, however poor in circumstances the parents might be. I have only seen one mother who wasn't pleased to see her baby, and that mother was insane. That beauty in life may be a *matter of taste* is shown by this experience. A patient consulted a colleague of mine as to whether she was pregnant. She thought she was, but could not account for her condition. She used quinine pessaries, and as there is a rumour that each box contains one "dud" her husband invariably tasted each pessary before use to make sure that it contained enough quinine! It has always been suggested that to call a spade a spade is a good idea—it seems to make things clear, somehow ; so let us call a pessary a pessary, and agree that contraceptives add to the pleasure of life. But as for beauty, I should say that a mother suckling her tenth child is a more inspiring subject than a bride inserting her first (?) pessary.—I am, etc.,

London, W.C.1, Nov. 25th. KATHLEEN E. MURPHY.

SIR,—In the debate at the Hunterian Society on birth control in modern life, opened by the Bishop of St. Albans, of which a summarized account appears in last week's *Journal*, the big guns of science appeared to be trained with deadly effect on the ground held by the bishop and his supporters. Science is so devastating! But after all, were some of the assertions of the bishop's opponents truly scientific? Is it so certain that even in these islands there is any immediate risk of over-population, were our resources fully developed? Is it not maintained by some, who have given serious consideration to the subject, that the present fall in the birth rate is dangerous, and that we may soon see a serious decline in population, boding ill for our by no means over-populated Dominions and Colonies? That Italy is fighting to obtain more room for her teeming population is at least doubtful ; rather does she seek minerals and raw materials.

The use of contraceptives by the unmarried was approved or condoned as being a better way of avoiding pregnancy than fear, but fear seems to be one method which Nature uses for her purposes, and in this matter one may recall Hunter's dictum to the effect that we can assist Nature, but not replace her. The results of getting rid of our evil may easily lead to the letting loose of seven greater evils, which, finding our present

social system so nicely garnished for them, may be very difficult to dislodge.

Without being in complete agreement with the Bishop of St. Albans, one may suspect that his outlook may possibly be wider and more truly scientific than that of his opponents.—I am, etc.,

London, W.8, Nov. 25th. HAROLD H. SANGUINETTI.

SIR,—In your issue of November 23rd (p. 1009) you gave publicity to the following view, expressed by the Bishop of St. Albans, who exalted self-control: "Birth control was a deliberate frustration of the biological ends of Nature." Perhaps, then, you will give similar publicity to the view that the same self-control is equally deliberate, and that it is an even more complete frustration of those ends.—I am, etc.,

London, W.11, Nov. 22nd. H. LL. JONES.

Contraceptive Technique

SIR,—In July, 1934, the National Birth Control Association set up a subcommittee consisting of qualified medical men and women, most of whom are experienced in giving birth control instruction in clinics and in private practice. This committee, having analysed replies to a questionary which was sent to doctors throughout the country, and made an intensive study of the investigations that are being carried out by scientific workers on the chemical and biological aspects of contraception, has arrived at certain conclusions which may perhaps be of interest to your readers.

In the first place, there is a general consensus of opinion that to obtain maximum security against undesired pregnancy reliance should be placed on a combination of contraceptive methods rather than on any single device. Briefly, the combination should consist of (*a*) mechanical barrier (a sheath or rubber pessary) between the semen and the cervix, and (*b*) a spermicidal agent. In view of the fact that rubber is damaged by fats, particularly by vaseline, non-fatty vehicles should be used for the spermicidal agents. Furthermore, as rubber is affected by heat, light, and time, all contraceptives should be kept cool and in the dark, and marked with the date of manufacture, and preferably also with the date beyond which they should not be used. A gelatin base is preferable for suppositories. Foaming tablets are not always reliable, as they depend for solution upon the vaginal moisture, the amount of which may vary within very wide limits. There is considerable evidence that quinine and chinosol are unsatisfactory spermicides, and that they can act as local irritants. Their use as chemical contraceptives has in some cases been followed by constitutional toxic symptoms.

In view of the extravagant claims made by some manufacturers of contraceptives in their advertisements, the subcommittee wishes to emphasize the fact that no chemical contraceptive at present available offers as high an expectation of success as the combination of methods mentioned above.

There are now about one hundred birth control clinics (either voluntary or municipal) in the United Kingdom, and nearly all the medical officers of these have gained their experience in the first place by attendances at other clinics. If the instruction is expert, sufficient medical training can be obtained by attendances at one demonstration or lecture and three or four clinical sessions. For many practitioners such an extended course may not be practicable, but those who wish to increase their knowledge of contraceptive technique can obtain the names of publications intended for the general practitioner, and also particulars of training, demonstrations, etc., from the National Birth Control Association, 26, Eccleston Street, London, S.W.1.

In conclusion, the subcommittee wishes me to state that the data on which the opinions expressed in this letter are based are available to any medical practitioner on application to the National Birth Control Association, which would for its part welcome information from practitioners as to their own experience.—I am, etc.,

M. A. PYKE,
London, S.W., Nov. 23rd. Secretary, National Birth Control Association.

War and Peace

SIR,—Curiously enough a book, entitled *No Mean City*, has just been published which illustrates our theme. The hero of the story has no possible chance of escaping out of his "family and neighbourhood life" in the slums of a great city. He is a born leader of boys, with some potential good qualities, but his only chance of being pre-eminent in the crowd which gathers round him depends on his power to lead them to fighting and destruction.

Dr. Kimber (vide this week's *Supplement*, p. 227) reminds us that the three spheres of human activity are "work, social relationships, and sex," and if these three go hopelessly wrong then men must drift on to a brute plane. Such a crowd congregates in any large city, intensified by mass action, and no helping hand seems to touch them. A vicious circle is created, and few emerge from it, however heroically they struggle. Much decentralization is needed before the truly great city, the city of culture and progress for all, can emerge. It is time we got down to removing causes as well as effects, and the first thing to do is to remove physical pressure and give people room really to live.—I am, etc.,

Letchworth, Nov. 24th NORMAN MACFADYEN.

Migraine

SIR,—I think I must be the "Thompson" referred to by Dr. C. Horwitz in the letter in the *Journal* of November 16th (p. 973). He refers to the report of some work of mine which appeared in the *Lancet* in 1932, and in connexion with it makes the following statement:

> "In one particular patient the ovarian secretion did not help when injected, so an operation was performed on the skull; they actually found the calcified roof to the pituitary fossa and were able to break it down and get rid of it in that way. The patient had no more headaches."

The statement is accurate but incomplete; the patient died shortly after the operation. The report of the post-mortem examination was included in my original account of the case.—I am, etc.,

Birmingham, Nov. 22nd. A. P. THOMSON.

Pyloric Stenosis in Uniovular Twins

SIR,—As the practitioner who delivered these infants (*Journal*, November 16th, p. 973), may I be permitted to make a few remarks. I came to the conclusion that the twins were uniovular because: (1) the placenta was a single one; (2) there was a single chorion; (3) although there was no fusion of the cords there were definite anastomoses between the umbilical vessels on the placental surface.—I am, etc.,

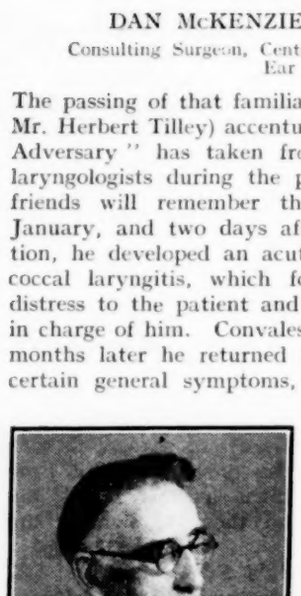
Pinner, Nov. 19th. C. B. THOMSON.

Obituary

DAN McKENZIE, M.D., F.R.C.S.Ed.

Consulting Surgeon, Central London Throat, Nose and Ear Hospital

The passing of that familiar figure Dan McKenzie (writes Mr. Herbert Tilley) accentuates the toll which the "Grim Adversary" has taken from the ranks of British oto-laryngologists during the past year. His more intimate friends will remember that towards the end of last January, and two days after a major abdominal operation, he developed an acute and severe type of streptococcal laryngitis, which for a few days caused much distress to the patient and considerable anxiety to those in charge of him. Convalescence was slow, but some two months later he returned to work, though not without certain general symptoms, which made it evident that some degree of toxaemia still persisted. As laryngologists, both the patient and I were very interested in the local and general manifestations of a somewhat unusual and severe type of laryngeal infection, and for this reason we recorded and commented on his "case" in the *British Medical Journal* of July 6th, 1935. It will be seen that under the heading "Symptomatology" the last paragraph reads: "Finally, the slow convalescence may be further retarded by the onset of cardiac symptoms, due to the influence of the streptococcal toxins in the myocardium." How little we imagined that this would be the ground on which the last battle would be fought—and lost!



Dan McKenzie was one of the few remaining laryngologists whose earlier professional life was spent in general practice and—in his case—it was first among the mining population of Lanark, and afterwards in a London suburb. In later years he often said that this experience was the secret of any success he had attained as a specialist, because he held that a wide perspective of medicine was absolutely essential before focusing attention on any of its branches. In due course, and like so many of his fellow-countrymen, he felt that it was only south of the Tweed "where every prospect pleases," and none more so than the one which pointed towards London. Having made his decision, it was not long before he was serving an apprenticeship in the Central London Throat, Nose and Ear Hospital, and later became a member of its staff. How much the success of that institution has been enhanced by Dan McKenzie's outstanding ability, tireless energy, and genial comradeship can only be duly assessed by the lay friends and professional colleagues amongst whom he worked for so many years. A similar gratitude will surely be felt by co-workers in the French Hospital in Shaftesbury Avenue and the many smaller suburban hospitals where, as consulting oto-laryngologist, his help was as valuable as it was freely given. But nowhere will his absence be more poignantly felt than in the Sections of Otology and Laryngology of the Royal Society of Medicine. There his clinical and scientific contributions were of the highest value, and were readily accepted by the editors of those home and foreign journals which are concerned with these branches of medicine. This is the more explicable because all Dan McKenzie's writings bore the imprint of authority; they were models of style and composition, and not infrequently the most technical subjects revealed his playful fancy and/or some hint of his deep human sympathy. These qualities and virtues, coupled with his high integrity of purpose, were never more in evidence than when he occupied the presidential chairs of the already mentioned Sections of the Royal Society of Medicine.

His striking and forceful personality was seen at its best when he engaged in debate—an art of which he was a skilful exemplar. Precise in the exposition of well-marshalled facts, he, with clear voice and fitting gesture, drove forth his convictions with all the ardour of a legal advocate. Had a casual visitor been present he might well have been pardoned for assuming that our colleague was a "dour Scot" who asked for no favours and certainly gave none. How little such an observer could have imagined that within this "Rupert of debate" there beat a heart full of tenderness and sympathy for anyone in need of them, and overflowing with gratitude to those who did anything for him. Maybe such declamations provided one method of releasing a pent-up energy which for many years had been repressed by an increasing deafness. Of a certainty it was this affliction which led him to seek means for the silent enjoyment of his leisure hours, and to this end he studied art, philosophy, folklore, and poetry. Some of us will treasure his collection of verses entitled "Twelfth Night," which we received last Christmas.

In concluding this brief obituary it may seem that sufficient stress has not been laid on Dan McKenzie's professional "records," although these can easily be gleaned from medical directories or other similar sources of information over his work and the immediate benefits which have accrued from it. Time will scatter its poppy-seeds of oblivion, but for the present those who had the honour of his friendship will reserve for him a little chapel in their hearts with an ever-burning light.

Sir D'ARCY POWER writes:

It is with a keen sense of loss that I contribute this note to the memory of Dr. Dan McKenzie. He was educated at Glasgow and Edinburgh, came to London, entered general practice, abandoned it for the treatment of diseases of the throat and ear, and made a name for himself both in surgery and in literature. He must have come early under the influence of Finlayson, whose interest in the history of medicine made Glasgow celebrated, for McKenzie spent such leisure time as he had in writing on literary subjects akin to medicine. Folklore he made his own, and his article on "Children and Wells" was reprinted in this *Journal* (1908, i, 105). In 1916 he wrote *The City of Din*; in 1920 *The Pride o' Raploch*; in 1923 *Aromatics and the Soul*; in 1925 *McMorro's Luck*; and in 1927 *The Infancy of Medicine*. The University of Glasgow recognized his literary work in 1925 by awarding him the history of medicine prize, and in 1927 he was elected a Fellow of the Society of Antiquaries. Medical historians and folklorists alike will miss his sane, kindly, and keen criticisms, which were always welcome.

Dr. C. O. HAWTHORNE writes:

Dan McKenzie was a man of very decided personality—vigorous, resolute, and persistent, yet sensitive withal, and not greatly concerned with the cultivation of the more superficial graces. Probably only those of us who were on intimate terms with him through a course of years realized fully his personal values; the best of him

was below the surface. In his work originality, thoroughness, and sincerity were prominent characteristics, and he was impatient of any second-rate standard. His wide sympathies touched many interests, as seen in his numerous and varied publications, and alike in poetry and in prose his literary gifts and standards are plainly written; in many of his verses is a true spark of poetic inspiration. By no means a talkative man he was yet an excellent talker, and his enthusiasms and crusading enterprises often surprised those who knew not his deeper convictions. In controversy he believed in and practised the rigour of the game. His *City of Din* proved itself the herald of the Anti-Noise League, and in *Aromatics and the Soul* his whimsical and sometimes sardonic humour, his classical equipment, philosophic outlook, and artistic sympathies found a full opportunity. More than all, in the affection and memory of his friends, his frank sincerity, his courage in the face of difficulties, and his loyal and generous comradeship have a secure and abiding place.

Dr. ARNOLD RENSHAW writes from Manchester:

As a man Dr. McKenzie had the dourness and sincerity of the Scot, with a sense of perception and driving force and assiduity in his work which brought him well to the front of his profession. He possessed a sense of humour which endeared him to all, and a moral backing from him did much to make anyone fight the harder. He was always receptive of new ideas once they had been passed by his excellent critical faculty. I felt it an honour to be asked to examine sections for him during his work on cholesteatoma of the middle ear and to be associated with him in the treatment of certain difficult cases of septicaemia. He delved into old Scottish and other folklore, and the antiquity of medicine found in him a thoughtful reader. As a writer to medical journals he never failed to attract interest, and his trenchant letters and replies were always worthy of the man. His books on technical matters are well known, but he was interested in general matters, smells, and noise, and such-like things, which the average person found commonplace. His *City of Din* and *Aromatics and the Soul* are examples of this. Words fail to give more than the slightest hint of the charm of McKenzie's personality, the lovableness of his nature, and the endearing quality of some of his characteristic traits.

"W. E. C. D.," in the course of a personal appreciation, writes:

Those of his friends who want to keep his memory green, and who are not already familiar with it, should read his fascinating and delightful book, *Aromatics and the Soul: A Study of Smells*. His account of a dog's day in the country, and its dreams thereafter by the fireside, "compounded of the gorgeous odours of some other world, such odours as even our woods in autumn know nothing of," leaves a picture that sticks in the imagination. When I first read the book on its appearance in 1923 I wrote to tell him how much I had enjoyed it, but I ventured upon one serious criticism: he had made no mention of the aroma of peat-reek from the chimney of a Highland cottage. His reply was: "There are some things too sacred even to write about!" Others will write of his scientific attainments, his skill as a surgeon, his thoughtful kindness to his patients, his flair for editorship and writing. My little note here is a memorial of a charming friend with the mind of a philosopher and the imagination of a poet. Last New Year he sent as a greeting to his friends a little booklet of verses: "These for Twelfth Night from Dan McKenzie."

[The photograph reproduced is by Elliott and Fry, Ltd.]

SIR TEMISTOCLE ZAMMIT, C.M.G., M.D.

The death in Malta of Sir Temistocle Zammit is regretted far beyond the medical profession of that island. Among his many activities archaeological studies took a prominent place, and it was a great disappointment to the members of the B.M.A. party who visited Malta on their way home from Melbourne that Sir Temistocle was prevented by illness from leading a tour of the Neolithic temple at Tarxien, the Hal Saflieni Hypogeum, and the ruins of Hagiar Kim.

Temistocle Zammit was born in 1864, and after studying in the University of Malta graduated M.D. in 1889. In the following year he was appointed Government analyst in the Maltese Public Health Department, and in 1905 professor of chemistry in the university. With a strong bent for research he played a leading part in the investigation of an outbreak of malaria in the island, and was a prominent member of the Mediterranean Fever Commission, as recorded in the appreciation printed below. In 1920, the year in which he received from the Liverpool School of Tropical Medicine the Mary Kingsley medal and the honorary degree of D.Litt. from the University of Oxford, he resigned his chair to take up the duties of Rector of Malta University. Relinquishing the Rectorship six years later, he became director of the museum department, a post congenial to him in every way. He had been an honorary Fellow of the Royal Anthropological Institute of Great Britain and Ireland since 1919, and was a corresponding member of the Société de Pathologie Exotique. In the public affairs of Malta he played an influential part as member of the Executive and Legislative Councils, and he was acknowledged far and wide as an authority on Malta and its antiquities. In recognition of his many-sided services to knowledge and to the island community he was created a knight in 1930. He joined the British Medical Association in 1916, and was president of the Malta Branch in 1923–4.

Lieut.-Colonel J. G. MCNAUGHT, late R.A.M.C., writes:

The obituary notices of Sir Temistocle Zammit published in the lay press deal at length with the work as an archaeologist which earned him a world-wide reputation, but say very little about his work for medical science. I first met him in connexion with the Mediterranean Fever Commission of the Royal Society, of which he was a member. He was then professor of chemistry in the University of Malta and director of the Public Health Laboratory in Valletta, as well as director of the Valletta museum. In spite of his onerous official duties he was able to devote a great deal of time to the work of the Commission, and it was owing to his discovery that large numbers of the goats in Malta were infected with the *Micrococcus melitensis* (*Brucella melitensis*) that the right road to the solution of the problem of how to eliminate the disease among humans was taken. What, however, I should like to mention with gratitude is the unselfish manner in which, without any trace of jealousy, he aided in every way the work of the Commission. His local knowledge and influence were invaluable, and always available to his colleagues. He put his private laboratory at their disposal, often, I fear, at the cost of much personal inconvenience.

Our work during the week left very little time for recreation, and in the Maltese summer was often most trying. It was made less so, and our energies revived, by our week-end excursions under Professor Zammit's expert guidance to places of archaeological interest in the islands. I have, in particular, vivid recollections of two week-ends spent in Gozo in his company, where the

fresher atmosphere and change of interest made a welcome break in one's routine. Sir Temistocle Zammit was not only a scientist but a man who, by his unselfish kindness, made a great contribution to the growth of better understanding and greater sympathy between Great Britain and Malta. *Requiescat in pace.*

WILLIAM LAMB, M.D., M.R.C.P.

Consulting Surgeon, Ear and Throat Hospital, Birmingham

With regret we report the death, on November 12th, of Dr. William Lamb of Birmingham at the age of 80, after a very active professional life, which included general practice and, later, consultant work in ear, nose, and throat diseases.

William Lamb had been distinguished from his student days at Edinburgh, where he graduated M.B., C.M. in 1876, and proceeded M.D. with honours in 1881; he obtained the diploma M.R.C.P. in 1898. Oto-laryngology was even then a special interest to him, and he studied it as well as other medical subjects in the universities of Vienna, Paris, Berlin, and Prague. He subsequently spent some years in general practice at Arnold, Nottingham, and the measure of the esteem and popularity which he won there was indicated in some measure by the number of his one-time patients and friends who journeyed to be present at his funeral in Birmingham. He removed to that city in 1898, and was appointed consulting aural surgeon to the Birmingham Medical Mission. Later Dr. Lamb became surgeon to the Birmingham Ear and Throat Hospital, and on his retirement, after seventeen years' service, he was placed on the consulting staff; he was also president of the aural board of the Ministry of Pensions for Birmingham and district. Dr. Lamb had been a member of the British Medical Association for forty-two years, and for a long period reported the proceedings of the Oto-laryngological Section at Annual Meetings: he was secretary of this Section when the Association met at Cheltenham in 1901, and vice-president of it at the meeting in Birmingham in 1911. He was the author of a practical guide to diseases of the nose and throat which recently achieved its fifth edition, and also translated from the German Grünwald's *Nasal Suppuration*.

A colleague writes: Dr. William Lamb was of a retiring but lovable disposition. He looked upon his professional work not so much as a means of livelihood, but rather as a means of benefiting humanity. Love of his work came before financial considerations. He was respected by a wide circle of colleagues in this country and on the Continent, most of whom have passed away. I have personally known him for thirty years, and have never known him to do an unworthy action or ever heard of his doing one. He held a refined and exalted view of life, and it was a privilege to be numbered among his friends. He leaves a widow and three sons, two of whom are in the medical profession.

ETTORE MARCHIAFAVA, M.D.

We regret to announce the death on October 22nd, at the age of 88, of Professor Ettore Marchiafava, the grand old man of Italian medicine. With the exception of Professor Pierre Marie, elected in 1896, Marchiafava was the most senior Honorary Fellow of the Royal Society of Medicine, having received this high honour in 1905, the centenary year of the parent society, together with the present King, then Prince of Wales, Professor Pavlov, and twelve others now deceased. He was born on July 3rd, 1847, in Rome, where he qualified in 1872. He first served as assistant to Tommassi-Crudeli, professor of morbid anatomy in the Faculty of Medicine of Rome, and succeeded him in 1883. During his occupation of this chair he carried out the important work which placed him in the front rank of Italian malariologists. Translations of his articles on the changes in the red cells in malarial infection, and the origin of melanaemia, written in conjunction with Angelo Celli, and on aestivo-autumnal fever, with Bignami, appeared in the New Sydenham Society's publications in 1888 and 1894 respectively. In 1916 he succeeded Professor Baccelli in the chair of clinical medicine, from which he retired in 1921, though he still continued to take active interest in medical science, and, in addition to articles on malaria, wrote on syphilis, tuberculosis, and renal and pulmonary diseases. In 1923 he published, with Nasari, a detailed account of the unique case of the Rumanian statesman Take Jonnescu, whose death was due to rupture of an abdominal aneurysm caused by ulcerative aortitis in convalescence from typhoid fever. One of his last publications was a communication, on May 18th, 1933, to the Section of Neurology of the Royal Society of Medicine, on degeneration of the brain in chronic alcoholism, a subject to which he had paid attention for the last thirty years.

Dr. PERCY TARGETT-ADAMS, who died on November 6th in Balham, had had an extensive public health career in South Africa as well as in Great Britain. The son of one of the first appointed medical officers of health for Maidstone and county public analyst for Kent, Percy Targett-Adams received his medical training at Guy's Hospital and Newcastle-on-Tyne, and from the days of childhood took a very special interest in the subject of public health. He obtained the diploma L.S.A. in 1886, the M.R.C.S. in the next year, and the D.P.H.Eng. in 1892. His major appointments were as follows: medical officer of health and Government bacteriologist and analyst in the Orange Free State, 1902 to 1910; assistant medical officer of health to the Union of South Africa, 1910 to 1923; and Government medical officer and resident medical officer in Francistown, Bechuanaland, 1924 to 1926. He had also a short term of service in Bombay, and held the rank of surgeon major in the South African Medical Corps. He was the author of numerous reports on public health and preventive medicine, and contributed articles on these subjects to various medical periodicals, including the *British Medical Journal*. The merit of his writings was enhanced by lucid and succinct portrayal of the statements and arguments. Dr. Targett-Adams was elected a member of the British Medical Association in 1902.

The death is announced of Dr. WILLIAM ROBERT ELSTOB UNTHANK of Cleckheaton, Yorkshire. Dr. Unthank took the degrees of M.B., B.S. at the University of Durham in 1910, proceeded M.D. three years later, and obtained the M.S. in 1919. He received the diploma in public health of the University of Cambridge in 1912, and in 1918 he was elected a Fellow of the Royal College of Surgeons of Edinburgh. Dr. Unthank held the post of senior house-surgeon at Ingham Infirmary, South Shields, before moving to the Spen Valley some sixteen years ago. He was for some years deputy medical officer of health for Spenborough and surgeon to the Spenborough Education Committee's school clinic, and also a certifying factory surgeon for the area. He joined the British Medical Association towards the end of the war and remained a member until his death. Dr. Unthank was a bachelor and lived with his sister, who is well known for her voluntary work for nursing divisions in the district.

The death is announced of Professor ALBERT MAIRET, honorary doyen of the Faculty of Medicine of Montpellier. Born in 1852, he was appointed in 1888 clinical professor of mental and nervous diseases, and held this appointment till he retired in 1922. The death is also announced of Professor BAYLAC of Toulouse at the age of 63. He was an expert in children's diseases, and took an active part in the promotion of child welfare.

Medical Notes in Parliament

[FROM OUR PARLIAMENTARY CORRESPONDENT]

Both Houses of the New Parliament met at Westminster on November 26th. The Peers took the oath, and the House of Commons again selected Captain E. A. Fitzroy as Speaker.

The King's speech will be delivered and debated next week. The Minister of Health is unlikely to ask the House of Commons to proceed before Christmas with any legislation for his department.

Universities and Colleges

ROYAL COLLEGE OF SURGEONS OF ENGLAND

ANNUAL MEETING OF FELLOWS AND MEMBERS

The annual meeting of Fellows and Members of the Royal College of Surgeons was held on November 21st. The quorum (thirty) was not obtained, so that no resolutions could be moved, but the PRESIDENT (Sir Cuthbert Wallace) said that he proposed to make a few observations on the annual report, and would be glad to hear the remarks of those who had given notice of the usual motion about the representation of Members on the Council.

The President then mentioned several items appearing in the report. A telegram had been received from Melbourne saying with what pleasure Sir Holburt Waring's visit had been received on the occasion of the opening of the Royal Australasian College. At the suggestion of the Société Nationale de Chirurgie of Paris steps had been taken to establish close scientific relations between that body and the Royal College of Surgeons. Meetings had been held between representatives of the two bodies and of the Association of Surgeons, and a committee of arrangement had been appointed to put into effect the activities contemplated. These were annual scientific meetings to be held between British and French surgeons, alternately in Great Britain and France; the translation and exchange of scientific articles for publication in the journals of each country; and the arrangement of visits by individuals or small parties to France or England, as might be required. The first meeting was to be held in London in July, 1936. After much deliberation the Council had decided to make no change in the scope and method of conducting the Primary Examination for the Fellowship. For the Fellowship Final it was now necessary for candidates to have held a house appointment for six months. The President also referred to the great value in the research work of the College of the gift of the Buckston Browne farm.

Dr. REDMOND ROCHE drew attention to a statement in the report that for the Final Examination for the Fellowship it was no longer necessary to hold a medical qualification registrable in Great Britain. Did this mean that the Membership diploma would be conferred after the candidate had obtained his Fellowship?

Dr. HOWARD STRATFORD pointed out that the Primary Examination expenses for 1935, £1,800, were twelve times as heavy as for 1934. The PRESIDENT said that this was on account of the over-seas examinations; the expenses were covered by the candidates' fees.

A Member drew attention to a reference in the report to the Macloglin Scholarship and to the statement that candidates "must not previously have passed an examination which normally exempts from a part or the whole of the Pre-medical Examination." Unless this was in accordance with the terms under which the money was left it seemed to be putting an embargo on persons with the more active brains. The PRESIDENT replied that experience had proved that the College did not get "duds." He had sat on the committee which considered the matter, and was satisfied that the rules were good and expedient.

Dr. ERNEST E. WARE suggested that the multiplication of diplomas was a mistake. Things were being too much divided up into little specialties. "Child health," for example, was important, but the subject was very much magnified, and people who had nothing else to do were taking up the matter at clinics. The PRESIDENT said that he would convey that expression of opinion to the Royal College of Physicians, which, however, was satisfied that there was a place for that diploma.

Dr. C. L. BATTESON had given notice of a resolution that Members, who constituted 90 per cent. of the College, should have some representation on the Council. In the absence of a quorum he could not move the resolution, but he put forward briefly the arguments in favour of the proposal.

Dr. RICHARD GILLBARD, who had intended to second the motion, suggested that it was fear of the British Medical Association which had led the Council to refuse to move in the matter. If, for example, there were eight or nine candidates for six seats, and the British Medical Association nominated six, the Association nominees would be elected and the others stand no chance. But even so, if the B.M.A. represented a majority it was entitled to the representation, and, after all, six Members on the Council would only represent one-fourth of the total number. He felt that the absence of any explanation by the Council to the representations made at successive annual meetings was discourteous.

Dr. H. E. WATKINS spoke of the great help which general practitioners might afford on the Council, and Dr. STRATFORD considered it amazing that the Council should never put forward any of the grounds on which it objected to the proposal.

Dr. ROCHE had given notice of a motion protesting against the suggestion set out in the annual report of awarding to persons not holding a medical qualification a diploma in dietetics. It could not be for the public good that a diploma should be given to unqualified persons, who, under the guise—or disguise—of a diploma from the two Royal Colleges would appear to be qualified to advise as to the diet of people in health or ill-health. How could these people detect early diabetes, kidney disease, and so on? Would these diplomates be content to play the part of skilled advisers of menus under medical direction? It might be said that they would only be engaged in mass production, supervision, and instruction with regard to dietaries in institutions. It was not the affair of the medical profession how far these super-cooks would work harmoniously with the super-chefs, but it was their affair that they should claim to intrude on the rightful domain of the physician in dictating diets.

The PRESIDENT agreed that the subject was a difficult one. It had been carefully canvassed by the Council and the committee concerned, and he did not think he was giving away any secret when he said that the opinion of the College was rather against the College giving the diploma direct. But it must be remembered that it was no good saying they were not going to have dietitians, for they already had them, and was it not better to ensure a certain standard and qualification?

The meeting ended without any resolutions being put.

UNIVERSITY OF OXFORD

Schorstein Research Fellowship

The Board of the Faculty of Medicine will make an election to the Schorstein Research Fellowship in Medical Science in June, 1936, if a candidate of sufficient merit presents himself. The Board has power, in special circumstances, to divide the Fellowship into two studentships.

The Fellowship, of the annual value of £200, will be tenable for two years, from October 1st, 1936, in any of the medical departments at Oxford, under such regulations as the Board may approve. Candidates must be graduate members (of either sex) of the University holding a registrable medical qualification, and must be under 35 years of age on October 1st, 1936. Candidates must submit their applications to the dean of the Medical School, University Museum, not later than May 4th, 1936. Each candidate must submit evidence of age, testimonials (five copies) or names of referees, statement of his career (five copies), and a statement of the department of medical science in which he proposes to research.

The electors to the Wilde Readership in Mental Philosophy have re-elected William Brown, M.D. (Christ Church), as Wilde Reader in Mental Philosophy for five years from June 9th, 1936.

UNIVERSITY OF LONDON

At a meeting of the Senate, held on November 20th, with the Vice-Chancellor, Mr. H. L. Eason, in the chair, Dr. V. B. Wigglesworth was appointed to the University Readership in Entomology at the London School of Hygiene and Tropical Medicine from October 1st.

The Services

DEATHS IN THE SERVICES

Colonel Edward Ormiston Butt, R.A.M.C. (retired), died at Bournemouth on November 12th, aged 78. He was born on March 4th, 1857, the eldest son of the late John Gillis Butt, was educated at Queen's College, Belfast, and in the School of the Royal College of Surgeons, Ireland, and took the L.K.Q.C.P. and L.R.C.S.I. in 1878, also subsequently the F.R.C.S.I. in 1884 and the D.P.H. of the Irish Colleges in 1888. Entering the Army as surgeon on February 5th, 1881, he attained the rank of colonel on September 15th, 1909, was placed on half pay on September 15th, 1913, and retired on March 4th, 1914.

Lieut.-Colonel Edward Mair, Bengal Medical Service (ret.), died in London on November 22nd, aged 88. He was born on July 3rd, 1847, the son of Mr. John Mair of Ellon, Aberdeen, and was educated at Aberdeen University, where he graduated M.B., C.M., with honours, in 1872. Entering the I.M.S. as surgeon on March 31st, 1874, he became lieutenant-colonel after twenty years' service, and retired, with an extra compensation pension, on July 3rd, 1902. Most of his service was spent in the Jail Department, chiefly in the North-West, now the United Provinces, where he served as superintendent of the central jails at Meerut, Benares, and Bareli successively, and was appointed Inspector-General of Jails in Bengal in August, 1898.

Medico-Legal

A CHARGE OF MANSLAUGHTER

At the Kent assizes on November 18th Dr. Robert Erskine-Gray, police surgeon at Chatham, was charged with the manslaughter of Edith Alice Forgham of Streatham, the wife of a seaman, on whom he was alleged to have performed an illegal operation. He was also charged on two other counts of unlawfully using an instrument on Mrs. Forgham and on another woman. He pleaded "Not guilty." It was stated on behalf of the prosecution that a man named Wells approached Dr. Erskine-Gray about the case of Mrs. Forgham and suggested a fee of £10 for the expected service, and that the doctor eventually agreed to a fee of £25, part of it to be paid in instalments. Dr. Erskine-Gray in the box denied the truth of the statements made against him, and that any money was passed or promised. He first saw Mrs. Forgham on the day before he admitted her to the hospital where she died. She told him that she had had a fall. He also denied the allegations relating to the case of the other woman.

After a two-day hearing Dr. Erskine-Gray was found "Not guilty" on all the counts alleged against him, and was discharged.

ALLEGED UNLAWFUL DETENTION

At Manchester assizes, before Mr. Justice Greaves-Lord, on November 18th to 20th, a case was heard in which Mr. J. C. D. Bustard of Rusholme sued Dr. Mul Raj Soni of Withington for alleged false imprisonment and assault. Mr. Bustard was at first represented by counsel, but later withdrew his instructions. Dr. Soni was represented by Mr. Lynskey, K.C., and Mr. Lustgarten, instructed by Messrs. Hempsons.

In the opening statement on behalf of the plaintiff he was described as a man aged 68 years, admittedly of highly nervous temperament, who on being taken ill with broncho-pneumonia in April, 1935, was persuaded by Dr. Soni to go into a nursing home, where it was suggested he should have a gland operation to abate his nervous trouble. Plaintiff alleged that while in the home he was regularly dosed with drugs, and was unable effectively to communicate with the outside world. Eventually, in October, after several unsuccessful attempts, he made his escape.

The defence was that there was no assault or false imprisonment, and that anything complained of was done with the acquiescence of Mr. Bustard. After the gland operation, performed at his request, a great mental change came over him, and he became violent. Counsel for the defendant said that he would call in mental specialists who would say that Mr. Bustard was suffering from manic-depressive insanity, and that while the attacks continued he ought to be subject to control. Dr. Soni's cross-examination by Mr. Bustard led the judge to interpose several times owing to the irrelevance of the questions. The jury intimated that in their view the case should not further proceed, and agreed that what was done by the doctor was in the interests of the patient and for his protection. In a final address to the jury Mr. Bustard broke down and had to be assisted from court.

Judgement was entered for Dr. Soni on the claim against him, and also on a counterclaim for £68 15s. for nursing home fees and services, with costs. Mr. Justice Greaves-Lord said that the case, so far as he could see, was absolutely clear that Dr. Soni had done the best that any man could do in very difficult circumstances.

Medical News

The annual dinner of the Irish Medical Schools' and Graduates' Association will be held at Savoy Hotel, Strand, W.C., on Thursday, December 5th, at 7.45 p.m.

The annual dinner of the Medico-Legal Society will be held at the Holborn Restaurant on Friday, December 13th, at 7.15 p.m., with the president, Dr. C. A. Mitchell, in the chair.

At a luncheon to be given by the Governors of the Papworth Village Settlement at Grosvenor House, Park Lane, London, W.1, on Wednesday, December 11th, over which H.R.H. the Duke of Kent will preside, a film, "The Story of Papworth," will be shown. It is hoped that this film will afterwards be exhibited to the public throughout the country.

The annual dinner of the Association of Certifying Factory Surgeons will be held at Langham Hotel, Portland Place, W., on Thursday, December 5th, at 8 p.m.

The annual dinner of the British Institute of Radiology and Röntgen Society will be held on Friday, December 6th, at 8 p.m., at Claridge's Hotel, Brook Street, W.

Mr. R. C. Maxwell, LL.D., will deliver a Chadwick Public Lecture on "Town and Country Planning and the Housing Act" at Inner Temple Hall, E.C., on Tuesday, December 3rd, at 8.15 p.m. Admission free, without ticket.

The Thomas Young Oration will be given by Professor Charles Fabry of the Institut d'Optique, Paris, on Friday, December 6th, at 5 p.m., at the Imperial College of Science and Technology, South Kensington, S.W.7. The title of the lecture is "Vision in Optical Instruments."

The London County Council announces that the new isolation block recently erected at Grove Hospital, Tooting, will be opened on Friday, December 6th, at 3.30 p.m. The block is a two-story building, and provides accommodation for sixty patients in single-bedded wards. The wards are separated by partly glazed screens, with duty rooms so placed that the nurses will be able to keep the patients under observation.

The annual meeting of the National Council for the Unmarried Mother and Her Child will be held at Carnegie House, 117, Piccadilly, W., on Monday, December 2nd, at 2.30 p.m., when Lord Gorell will preside. Mr. H. E. Norman will give an address on "Social Work in the Courts."

The Fellowship of Medicine announces that a course in thoracic surgery will be given at Brompton Hospital from December 2nd to 7th. Two special classes have been arranged for M.R.C.P. candidates: at Brompton Hospital, chest diseases, two days a week, at 5 p.m., from December 9th to January 10th (excluding Christmas week); City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E., diseases of the heart and lungs, Wednesdays and Fridays, at 6 p.m., from December 10th to January 10th (excluding Christmas week). Full information may be obtained from the Fellowship of Medicine, 1, Wimpole Street, W.

The international post-graduate course in Röntgen-ray diagnosis and radiotherapy, arranged by the Berliner Akademie für ärztliche Fortbildung, will be held from March 9th to 14th, and not in April as previously stated.

The fourth biennial Conference on Mental Health will be held at the Central Hall, Westminster, S.W., from January 23rd to 25th, 1936. It is hoped that the conference will be opened on Thursday, January 23rd, by H.R.H. the Duke of Kent, president of the National Council for Mental Hygiene. Applications for tickets and all correspondence relating to the conference should be addressed to the Secretary, The National Council for Mental Hygiene, 78, Chandos House, Palmer Street, London, S.W.

The first regular air ambulance in this country was put into service by Mrs. Victor Bruce at the Airport of London, Croydon, on November 23rd, when a demonstration was given. Within a few seconds of the sound of a gong the aeroplane, white-painted and with the Red Cross on its fuselage, was wheeled out of its hangar. A motor ambulance arrived with a member of the staff of Air Dispatch Ltd. impersonating the patient, and in twenty minutes the aeroplane was in the air. The cabin of the air ambulance is automatically heated and ventilated, and the provision of a special bed gives greater comfort to the patient than is possible with an ordinary stretcher. It will be available day and night.

The Duke of York presided at a banquet in Grocers' Hall on November 26th, the object being to launch the scheme for rebuilding Queen Charlotte's Maternity Hospital. His Royal Highness drew attention to the increased demand for accommodation for patients and training, and emphasized the urgent need of moving to a bigger area, where a modern building should be put up with all speed. Other speakers included the Lord Chief Justice and Dr. Watts Eden, past-president of the Royal Society of Medicine, who announced that the new building, the first of its kind in this country, would contain 230 public and private beds for mothers, and would cost £300,000, a striking feature being the privacy and quiet achieved and the unique facilities for teaching, training, and research, all so essential if the grave national problem of maternal mortality was to be solved. Building operations will begin in the new year.

On October 31st the Berlin Medical Society celebrated the 75th anniversary of its foundation. It was formed on October 31st, 1860, by the fusion of the Society for Scientific Medicine with the Berlin Medical Union. Its first scientific meeting was held under the presidency of Langenbeck.

The October issue of the *American Journal of Obstetrics and Gynecology* contains an article by Dr. Brooke M. Anspach of Philadelphia on the contributions of Great Britain to gynaecology and obstetrics.

The current July–September issue of the Epidemiological Report of the Health Section of the League of Nations is devoted to yellow fever.

The issue of *Le Bulletin Médical* for October 25th is devoted to the subject of sterility.

The issue of the *Chinese Medical Journal* for September is a special number dealing with medical education in China past and present.

The colleagues, friends, and pupils of the late Professor Chauffard have decided to have a medallion of him placed in the Hôpital St. Antoine, to which he was attached. Subscribers of 100 francs and over will receive a bronze copy of the medallion. Subscriptions should be sent to the treasurer, M. Georges Masson, 128, Boulevard St. Germain, Paris 6e.

The Rockefeller Foundation has made the University of Chicago a donation of 243,000 dollars, of which 168,000 is to be spent on the establishment of a psychiatric clinic.

The recent decline of the birth rate in Japan is shown by the following figures: 1932, 1,000,868 births; 1933, 927,000; 1934, 809,224.

To the list of members of the medical profession elected to the House of Commons at the recent General Election, published in our last issue at page 1008, should be added the name of Major B. H. H. Neven-Spence, R.A.M.C. (ret.), who has been returned as Member of Parliament for the Orkney and Shetland Division. Major Neven-Spence stood as a Conservative candidate, and polled 8,406 votes. His opponent received 6,180 votes.

The Prince of Wales has appointed Sir Ernest Pooley to be an honorary secretary of King Edward's Hospital Fund for London.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The **TELEPHONE NUMBER** of the British Medical Association and the *British Medical Journal* is EUSTON 2111 (internal exchange, five lines).

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EDITOR OF THE *BRITISH MEDICAL JOURNAL, Aitiology Westcent, London.*

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The address of the Irish Office of the British Medical Association is 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin), and of the Scotish Office, 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 24361 Edinburgh).

QUERIES AND ANSWERS

Glandular Fever

"E. F. G." writes: Does any reader know of a way of shortening an attack of glandular fever in an adult with intermittent pyrexia for thirteen weeks? The use of convalescent serum is impracticable.

Black Tongue

Dr. J. LIVINGSTON (Barrow-in-Furness) writes in reply to "G. T. B." (November 23rd, p. 1029): This condition, which I suppose is due to a fungus, in two recent cases cleared up under the following treatment. (1) Mist rhei and bismuth; (2) pot. chlor. ʒj, glycerin, glycothymol āā ʒj, applied frequently to the tongue; (3) an "aldoform" tablet sucked every four hours.

Pruritus Vulvae et Ani

Dr. JAMES GARDNER (Gourock, Renfrewshire) writes: I would refer "Perplexed" (November 23rd, p. 1029) to a paper published in the *Journal* in 1931 ("Pruritus Ani," by W. P. MacArthur, August 22nd, 1931, p. 334). The author shows that threadworms are often the cause of pruritus ani. The treatment consists of daily injections of warm water containing one tablespoonful of common salt to the pint. In addition, I should recommend him to use Eustace Smith's treatment as outlined in his *Diseases of Children*—namely, order three powders, each containing 3 grains of santonin, 1/2 grain of calomel, and 5 grains of sacch. lactis, one powder every second night and followed by a big dose of castor oil in the morning; also give 5-grain doses of citrate of iron three times a day. A little mercurial or calomel ointment rubbed round the anus would destroy any possible eggs.

"KENSINGTON" writes: I would advise "Perplexed" to try a cod-liver oil preparation, unguentum desitin. I have recently found it most useful in a rather intractable case of pruritus ani secondary to piles.

Income Tax

Allowance for Expenses

"TUBERCLE" inquires whether the following expenses can be deducted in calculating liability of salary as county council tuberculosis officer: (1) subscriptions to medical societies, (2) visits to London, etc., in connexion with such societies, (3) repairs to upkeep of typewriter and camera used partly in connexion with his specified duties, and (4) cost of publishing articles on tuberculosis.

*** The statute requires that expenses to be allowable shall be incurred wholly, exclusively, and necessarily in the performance of the duties of the office. Where an appointment under a local authority is concerned the test of "necessity" is whether the authority requires the expenditure to be incurred as a condition of the employment. Judged by that test probably the only allowable expenses are those under (3)—that is, assuming that the articles in question are necessary for the proper performance of the duties.

Total Income for Life Assurance Relief

"SHORT" refers to the restriction of the relief to tax on one-sixth of the total income, and asks whether superannuation deductions and interest on loan must be regarded as reducing the amount of total income for that purpose.

*** Yes. The superannuation deductions are treated as expenses, and the interest is required to be deducted by express provision in the Acts.

LETTERS, NOTES, ETC.

A Case of ? Trance

"E. T." (County Durham) writes: The following rather rare case is reported, first, that someone may give me some particulars which will elucidate the condition, and secondly, in the hope that some advice as to the treatment may be forthcoming. The patient was an unmarried woman, 30 years of age, who had been under treatment for some five years. She had had one ovary removed, and dated her troubles from that time. She had also been in and out of hospitals for further operations, apparently for adhesions. About five years ago she began to have "faintings" at the beginnings of her menstrual periods. These were at first of short duration, but gradually increased until it was recognized that she was unconscious and that the condition was not one of fainting. I saw her when the attack had been on for an hour. On examination the patient lay on her back in a deep sleep, perfectly flaccid, and entirely oblivious to her surroundings; breathing was scarcely perceptible, and she did not respond to painful stimuli. The eyeballs were turned upwards, and the pupils dilated. The pulse was feeble and slow. The heart sounds were weak and distant. As the patient began to come out of the coma the supra-orbital muscles resisted when attempts were made to open the eyes, the pupils began to contract, some minutes elapsed before vision returned, then hearing returned and sensation was gradually regained in the extremities, though there was a distinct latent period before a stimulus applied to the sole of the foot was recognized. This particular attack lasted four hours, but she soon relapsed. Recovery was ushered in by a deep sigh. During the attack the knee-jerks were exaggerated, the light reflex was absent, and the patient made no objection to her eyeballs or cornea being touched. No signs of consciousness could be observed or elicited by any painful stimuli. The patient had no recollection of the attack, but afterwards complained of weakness. She also explained that as she recovered she had a sensation of being pulled back, and this sensation appeared to occur at or about the time that the pupils began to contract. While for most of the attack breathing could not be observed, there were short periods when the respirations became deeper for a minute or two. Temperature was normal, and the catamenia was present. On this occasion the attack lasted for two days, with intervals, possibly due to treatment by strychnine and digitoxin. I was informed that these drugs were the only ones helping to bring the attacks to an end, but that larger and larger doses were being required. I satisfied myself that the case was not one of ordinary hysteria or epilepsy. The heart and organs appeared normal. In between the attacks the girl was bright and vivacious, and employed herself in pursuits likely to keep her mind occupied, and she is anxious to obtain treatment and cure. From her mother I learned that the attack came on suddenly at the beginning of menstruation, and that the girl fell down unconscious. She was taken to bed and the doctor sent for if the family failed to rouse her. I saw no reason why she should be aroused. There were several sisters and brothers, all healthy. The patient told me that she thought that there were sometimes some movements of the eyes before she fell, but she was not quite sure of this. She would be glad to go anywhere to be put under observation with a view to recovery.

The Cobbler and His Last

Dr. THOMAS MARLIN (London) writes: In a recent medical weekly reference was made to a shoemaker "Jock," who lives in North London, and who has attained great fame because of the relief he gives to many people; and now a Sunday paper has given an article on the same man. This article states that "he says he has psychic qualities which enable him to diagnose sufferers' illnesses by looking at their shoes." As many medical men are now sending patients to "Jock," and as he has helped and worked with some of the foremost orthopaedic surgeons of the day, it it is only right to state on his behalf that he has never professed to have psychic qualities. On the other hand, he is very much against humbug. But he certainly has very acute powers of observation: he notices things which are never imagined by the ordinary person, and which are not taught to medical men, and hence people might think he is a psychic. It seems only fair to him that this should be stated, and also it should be made known that he is not seeking publicity. Reporters pester him for interviews, but he has always declined.

To-day's Uses for Yesterday's Drugs

Dr. JAMES BURDON-COOPER (London, S.W.) writes: I have read Dr. J. C. Lyth's article with interest (November 9th, p. 903), in particular with regard to the use of phenol as a gastric sedative. May I suggest that his use of phenol in this connexion is surely nothing but applied homoeopathy. The action of carbolic acid in drop dose of the *B.P.* solution and in higher dilution (potency) has been known to homoeopaths for years, especially in cases of excessive nausea and vomiting, and in the vomiting of Bright's disease, sea-sickness, cancer, and pregnancy. It has also had its uses in pneumonia. Dr. Lyth describes the results of 2 minims of carbolic as "dramatic." It is this quality of the result which is the hall mark of the exact homoeopathicity of the drug to the symptoms of the patient he treated with it. He could hardly have chosen a more suitable case in the textbook if he had set out to demonstrate the principle of *Similia similibus curentur*, the principle that a drug will cure those symptoms produced by disease similar to those which it can itself produce in a normal healthy subject. The similarity in symptomatology between the gastric, respiratory, and cerebral manifestations of uraemia, and that of carbolic acid poisoning, is close enough to be striking.

Treatment of War Wounds

Dr. N. PINES (London, E.1) writes: I think that during the great war I saved many a life by packing artillery and bomb wounds, blackened and gangrenous, with gauze soaked in oil of turpentine. The older the oil the better. The surrounding skin must be protected by vaseline. The gangrenous tissue falls off after a few dressings, and healthy granulations appear. I do not remember having a single case of gas-gangrene with this method of treatment.

Pediculosis Capitis in a Factory

"J. B. A." writes: If "F. S." will get a basin of hot water, add some Jeyes' fluid and some ammonia, immerse the patient's head in the fluid, keep the hair wet with the fluid for twenty minutes, then dry with a sponge or a cloth, he will find when he examines it next day that all the pediculi and all the nits are dead.

Disclaimer

Dr. E. SHIRLEY JONES (Bentley, Hants) writes: I enclose a page from the current number of the *Droitwich Guardian*, on which my name is coupled with an impending change in a medical partnership. The facts mentioned are true, but were published without my knowledge or consent.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 46, 47, 48, 49, 50, 51, and 54 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 52 and 53.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 244.